Suicidality and Cognition:

Towards an Explanation of Why Some People Believe They Should Die

Catrin Fagan

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Contents

List of Tables

List of Figures

List of Appendices

List of Abbreviations

BPS	British Psychological Society
BRS	Brief Resilience Scale
NHS	National Health Service
PHQ-9	Patient Health Questionnaire-9
QAF	Quality Assessment Framework
SBQ-R	Suicide Behaviour Questionnaire-Revised
SBS	Suicidal Belief System
SCS	Suicide Cognitions Scale
SI	Suicidal Ideation
TIPI	Ten Item Personality Inventory
WHO	World Health Organization
WHOQOL-BREF	World Health Organization Quality of Life-Brief

Acknowledgements

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Finally, I would like to dedicate this to those whose lives have been touched in some way by suicide: especially the people lost too soon, and those who always miss them.

Declaration

This thesis has not been submitted for any other degree or to another institution. It was conducted under the supervision of Dr Anthony Colombo (Clinical Psychology Doctorate, Coventry University), and Dr John Baker (Clinical Psychologist, Coventry and Warwickshire NHS Partnership Trust). The named supervisors were involved in developing the original research ideas and have provided suggestions and feedback throughout, including reading drafts of the chapters. Apart from these collaborations, this thesis is my own work.

Chapters one and two of this thesis have been prepared for submission to the journal Suicide and Life Threatening Behaviour, under the authorship of myself and the two research supervisors detailed above.

Summary

This thesis is organised around three chapters. Each examine patterns of cognition that can lead some people toward or away from the various stages of suicidality; thoughts, plans or attempts to die.

Chapter 1 presents a systematic review of the literature, examining the relationship between optimism and suicidal ideations. The emerging evidence-base suggests the existence of a weak to moderate negative relationship; as levels of optimism increase, so the strength of suicidal thoughts are weakened. The studies reviewed also indicate that the utility of optimism is more evident in terms of its moderating or mediating effect on other prominent variables such as hopelessness and life-stressors. The clinical significance of these findings are discussed and suggestions for future research considered.

Chapter 2 details an empirical investigation of Rudd's Suicidal Belief System (SBS) and its role, alongside other psycho-social factors, in formulating a risk prediction model of suicidality. The study adopted a cross-sectional design, employing a range of psychometrically valid self-report measures. The sample population consisted of 114 participants, representing a control group: 'Nevers'; and three different levels of suicidality: 'Thinkers'; 'Planners'; 'Attempters'. Principal Axis Factoring confirmed the existence of Rudd's underlying SBS. That is, a pattern of cognitions characterised by a pervasive sense of hopelessness; that life was 'unbearable', problems were 'unsolvable', and the suicidal person was 'unlovable'. Analysis of Variance suggested that the intensity of these cognitions were strongly differentiated by depression severity, though the causal nature of the relationship between cognitive and affective states was difficult to determine. Binary Logistic Regression helped formulate a

tentative risk prediction model of suicidality, organised around the traits of hopelessness, low resilience, and neurotic personality-type. Clinical implications of the findings are discussed, alongside suggestions for future research on patterns of suicidality and cognition.

Chapter 3 recounts my reflections on the research process and its influence on my personal and professional development. This discussion is framed around Beck's cognitive triad; reflections linked with my 'self', the world in which I live and work, and my future-outlook.

Overall Word Count: 19,108

(Excluding: tables, figures, references and appendices)

Chapter 1

Literature Review

Does Optimism Reduce the Risk of Suicidal Ideations? A Systematic Review of the Literature

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(see Appendix A for author guidelines)

1.1. Abstract

Aim: This paper systematically reviews the empirical literature on the relationship between optimism and suicidal ideations. **Method:** Using PsycINFO, MedLine, Applied Social Sciences Index and Abstracts (ASSIA), Web of Science and Cumulative Index to Nursing and Allied Health Literature (CINAHL) databases, 21 original studies were identified that met the inclusion and quality assessment criteria. **Findings:** The results highlight three key issues: 1) optimism is negatively and moderately associated with suicidal ideations; 2) optimism offers protection against suicidal ideations even in the context of risk factors such as hopelessness and life stressors; 3) measurement of optimism and suicidal ideations can vary, potentially limiting conclusions drawn from the literature. **Conclusion:** Brief measurement of optimism can usefully inform risk assessment, formulation, intervention and treatment progress. Psychological interventions targeting the promotion of optimism may prove effective in helping to reduce suicidal ideations, especially alongside a target to reduce cognitions linked with hopelessness and burdensomeness.

Keywords: optimism, suicidal ideations, suicidality, protective, review

1.2. Introduction

1.2.1. Suicidality and Suicidal Ideations

Suicidality describes the totality of suicide-related thoughts and behaviours. As such, suicidality encompasses suicidal ideations, suicide planning, and self-inflicted, potentially injurious behaviours related to suicide attempts and death by suicide (Silverman, Berman, Sanddal, O'Carroll & Joiner, 2007a; Wenzel, Brown & Beck, 2009).

Suicidal ideations (SI) have been defined as: "Any self-reported thought of engaging in suicide-related behaviour" (O'Carroll et al., 1996; p.247). They can comprise specific attitudes, beliefs, or plans relating to death by suicide, and are purely cognitive in nature (Silverman, Berman, Sanddal, O'Carroll & Joiner, 2007b). SI develop from maladaptive cognitions relating to the self, the world and the future, alongside associated conditional assumptions and compensatory strategies. This has been termed the "Suicidal Belief System" (Rudd, 2000). Ideations comprising this system are characterised by pervasive hopelessness and themes of the self as unlovable, life as unbearable, and problems as unsolvable.

Lifetime prevalence of SI has been estimated to range substantially across countries, from 2.6% (Chennai, India) to 25.4% (Durban, South Africa; Bertolote et al., 2005). Another international study estimated SI prevalence as 9.2%, and reported little variation amongst high, middle and low-income countries (Nock et

al., 2008). SI within clinical groups are common (Tarrier, Barrowclough, Andrews & Gregg, 2004; Valtonen, Suominen, Mantere, Leppamaki, Arvilommi & Isometsa, 2005). However, SI have also been found to be prevalent amongst students, with some reported rates as high as 50% (Johnson, Gooding, Wood & Tarrier, 2010). This indicates that the negative impact of SI is not limited to clinical populations.

Rudd (2000) stated the "central pathway for suicidality is cognition, that is, the private meaning assigned by the individual" (p.21). Thus, SI can be considered a 'gateway'; an entrance point to a continuum of suicidality, whereby SI are a logical and common predecessor to suicide-related behaviours (Beck, Kovacs & Weissman, 1979; Mann, Waternaux, Haas & Malone, 1999). Researchers have advocated for targeting suicidality at the point of ideation (Johnson, Wood, Gooding, Taylor & Tarrier, 2011; Rasmussen, 2006), and for targeting suicide-relevant cognitions directly (Wenzel & Jager-Hyman, 2012).

1.2.2. Predicting the Risk of Suicidal Ideations

Epidemiological and psychological autopsy studies have traditionally attempted to predict the risk of SI through measuring behavioural aspects of suicidality, such as rates of attempts or death, within populations defined by specific socio-demographic characteristics. For example, risk of suicidality appears associated with being unmarried, having fewer years of formal education, a family history of suicidality and mental health difficulties (Kessler, Borges & Walters, 1999). In terms of religion, suicidality is most likely in Atheist countries

(e.g. China) and least likely in Muslim countries (e.g. Kuwait; Bertolote & Fleischmann, 2002). SI and suicide attempts are more likely among women and those of younger age (Nock et al., 2008). However, death by suicide is more likely among men or those aged over 65 (World Health Organization [WHO], 2014).

In terms of affect-based risk prediction studies, psychologists have attempted to examine the relationship between SI and emotional well-being. For example, studies have linked SI with a history of childhood abuse (Brown, Cohen, Johnson & Smailes, 1999) and negative life-events (Flannery, Singer & Wester, 2001). SI is more likely in those with a mental health diagnosis, particularly those with co-morbid diagnoses, difficulties with mood and impulse control (Kessler et al., 1999; Nock et al., 2008). In particular, SI have been consistently associated with depression (Beck, Steer, Beck & Newman, 1993).

Trait-based risk factors have also been shown to predict SI. For example, personality traits such as neuroticism and extraversion (Brezo, Paris & Turecki, 2006), impulsivity (Mann et al., 1999) and perfectionism (Hewitt, Flett & Weber, 1994) increase the likelihood of SI. Cognitive traits such as hopelessness (Beck et al., 1993), rumination (Morrison & O'Connor, 2008), and problem-solving deficits (Priester & Clum, 1993) are also associated with SI.

However, factors that may offer protection against SI have, in relative terms, been overlooked within the risk prediction literature. It is only recently that the influences of protective factors have been recognised as a necessary

component of risk assessment, and as affording greater accuracy in risk prediction (Cheavens, Cukrowicz, Hansen & Mitchell, 2016; Chin & Holden, 2013; Wingate et al., 2006). Several protective factors have been proposed, including: higher levels of perceived social support and life satisfaction (Chioqueta & Stiles, 2007); having children, in particular being a mother (Hoyer & Lund, 1992); being married (Welton, 2007); religious beliefs or ethnicity (Hirsch, Nsamenang, Chang & Kaslow, 2014; Oquendo et al., 2005); and high self-esteem (Lakey, Hirsch, Nelson & Nsamenang, 2014). Among those potential protective factors beginning to be considered, is optimism.

1.2.3. Optimism: A Protective Barrier Against Suicidal Ideations

Optimism has been defined as a general expectation of a favourable future and of meeting one's goals in life (Scheier & Carver, 1985). Optimism is characterised by positive, future-oriented beliefs related to the self (e.g. "I can be successful"), the world (e.g. "others will help me if I need it"), and the general future (e.g. "things will work out"). Optimists attend to, organise and retrieve information that is consistent with their generally positive outlook, discarding information that is dissonant; so that such cognitions are subject to a processing bias which is positive in nature.

Any manifestation of optimism can have temporal (i.e. explanatory versus future-oriented), etiological (i.e. personality versus learned), and situational differences; as such, it is a broad construct (Hirsch & Conner, 2006). Optimism can be considered a stable, dispositional trait, reflected by consistent

behavioural self-regulation which is influenced by positive future-expectancies (Carver & Scheier, 2001). Optimists are more likely to expect to attain a goal, and therefore approach situations confidently and expel more effort in order to succeed; thus, positive cognition influences behaviour (Carver & Scheier, 2001). Optimism can also be characterised as adopting a particular attributional style: attributing stress or negative life-events as external to one's self (rather than internal), specific to a situation (rather than due to global deficits), the consequences of which are temporary (rather than stable) (Buchanan & Seligman, 1995). Therefore, one might expect optimism to offer protection against distress; optimism may positively influence how stressors are perceived, tolerated and overcome. Indeed, studies have corroborated this, demonstrating that those higher in optimism reported less distress following a traumatic event (Hooker, Monahan, Shifren, & Hutchinson, 1992) and lower levels of perceived stress (Benight & Harper, 2002). Optimism has also demonstrated associations with adjustment following physical health problems (Carver et al., 1993; Johnson, 1996); psychological well-being (Fredrickson, 2000); as well as reduced symptoms in anxiety, post-traumatic stress disorder, obsessive-compulsive disorder and depression (Davidson & Wingate, 2013). Given its apparent protective effects, we may expect optimism to afford similar benefits to those with SI.

Optimism may overlap with similar constructs; most notably pessimism, hopelessness and hope. Optimism and pessimism are both types of expectations for the future; yet while the former is positive in nature, the latter is negative. In contrast to optimists, pessimists typically attribute negative life-

events to permanent, pervasive and internal causes (Wingate et al., 2006). Evidence suggests that optimism and pessimism are distinct constructs (Herzberg, Glaesmer & Hoyer, 2006). Optimism and hopelessness are also types of future-expectations. Optimists expect that things will happen in their favour, whereas people with a hopeless outlook expect the future to hold undesirable events and failure (Ellis & Rutherford, 2008). Again, evidence suggests optimism and hopelessness are distinct constructs (O'Connor & Cassidy, 2007). Optimism and hope both involve positive expectations for the future. However, hope emphasises strategic thought (i.e. positive cognitions about the specific pathways one will take to achieve a goal) in a way optimism does not. Therefore, hope refers to a more specific goal, whereas optimism is more of a global expectation (O'Keefe & Wingate, 2013, Snyder, 2002). Hope and optimism have also demonstrated their discriminant validity (Bryant & Cvengros, 2004).

1.2.4. Rationale

By its nature, SI could be considered reflective of "an individual who sees no chance of a brighter future" (Rasmussen, 2006, p.3). Thus, investigation of the influence of optimism on SI seems intuitive and warranted (Rasmussen & Wingate, 2011). Further, optimism has demonstrated an association with factors linked with SI, such as effective problem-solving (Shatte, Gillham & Reivich, 2000), better social support (Brissette, Scheier & Carver, 2002), and perhaps most pertinently, reduced depression (Chang & Sanna, 2001).

The aim of this paper is to systematically review literature that has examined the predictive relationship between the cognitive trait generically referred to as 'optimism' and an early cognitive construct along the continuum of suicidality, namely suicidal ideations. More specifically, this review will address the question: Does optimism reduce the risk of suicidal ideations?

1.3. Method

1.3.1. Search Process

A systematic search of the literature for original research studies that have investigated the relationship between SI and optimism was carried out in February 2016. The most relevant databases covered literature within psychology, medicine, mental health studies and nursing and included PsycINFO, Medline, Applied Social Sciences Index and Abstracts (ASSIA), Web of Science, and Cumulative Index to Nursing and Allied Health Literature (CINAHL). The reference lists of extracted articles were manually searched for additional relevant studies. Searches were also carried out for grey literature using Google Scholar and library catalogues. All studies identified by the initial search were added to EndNote (Thomson Reuters, 2016).

Table 1.1: Systematic Review Search Terms

Concept	Variation	Location of Keyword
Suicidal ideation	Suicidal ideation* Suicidal thought* Suicidal feeling*	Title and abstract
Optimism	Optimis* Future orient* Future disposit* Future expect*	Title and abstract
Relationship	Relation* Link* Associat* Correlat* Impact* Effect*	Article

*Note: Searches performed using * to truncate keywords to capture all variations of the term, wild card ? to capture English/American spellings, and speech marks "" to locate a particular phrase. Suicidal ideation, optimism and relationship concepts were combined using the Boolean operator 'AND', capturing synonyms using the operator 'OR'.*

1.3.1.1. Search Terms

Table 1.1 presents an overview of the key search terms used, relevant to the subject area of interest. These terms include the main concepts of suicidal ideations, optimism and relationship, and synonyms, e.g. association, link, correlation, etc., were identified to capture as much breadth of coverage in the search as possible. SI and optimism were searched for in the title and abstract, and relationship in the wider article.

1.3.1.2. Search Strategy

The search strategy involved the Boolean operators AND and OR, as follows: suicidal ideations OR suicidal thoughts OR suicidal feelings AND optimism OR future orientation OR future disposition OR future expectancy AND relationship OR association OR link OR correlation OR impact OR effect.

1.3.2. Inclusion and Exclusion Criteria

1.3.2.1. Initial Screening

Article titles and abstracts were initially screened and retained if they were: (a) written in the English language; (b) published in a peer reviewed journal; (c) considered original research; and (d) full text was accessible. Following initial screening, full text articles were obtained and assessed for eligibility for review according to the following set of specific inclusion criteria (see Table 1.2 below for details).

1.3.2.2. Specific Inclusion Criteria

Studies were included if they: (1) measured SI using a standardised measure. Measures were accepted as standardised only if their psychometric properties in terms of reliability and validity could be verified. This is important to ensure that a measure is consistently measuring what it intends to measure (Coolican, 2005); (2) measured optimism using a standardised measure. Studies measuring concepts such as positive future orientation were included as they are conceptualised as broader than, but incorporating, optimism (Hirsch et al., 2006); and (3) empirically tested a relationship involving these two variables,

using correlational methods such as multiple regression or mediational path analysis. As a result, only quantitative empirical studies were included in this review.

It has been suggested that, like other self-related cognitions, optimism may still be developing in adolescence (Caspi & Roberts, 1999). Therefore, participants were limited to those aged 18 and above. No limits were placed relating to participants' gender. Evidence indicates that males and females are not significantly different in terms of optimism (Boman, Smith & Curtis, 2003). Optimism has been linked with a range of mental health diagnoses (Wingate et al., 2006), but as suicidality 'cuts across' diagnosis it was considered of value to include participants regardless of diagnosis. No limits were placed on sample size, methods of recruitment or data collection, study design, or other measures included in the study; other than those criteria previously stated.

Samples from all countries were included even though cultural differences may impact on how optimism is conceptualised or reported (Abdel-Khalek & Lester, 2006). Scales used were validated in other cultures. Thirteen studies used sample populations from the USA, two from Canada, two from Europe (UK and Spain), one each from Australia, China and Jordan, and one study compared samples from the USA and Kuwait. Studies were published between 1997 and 2016.

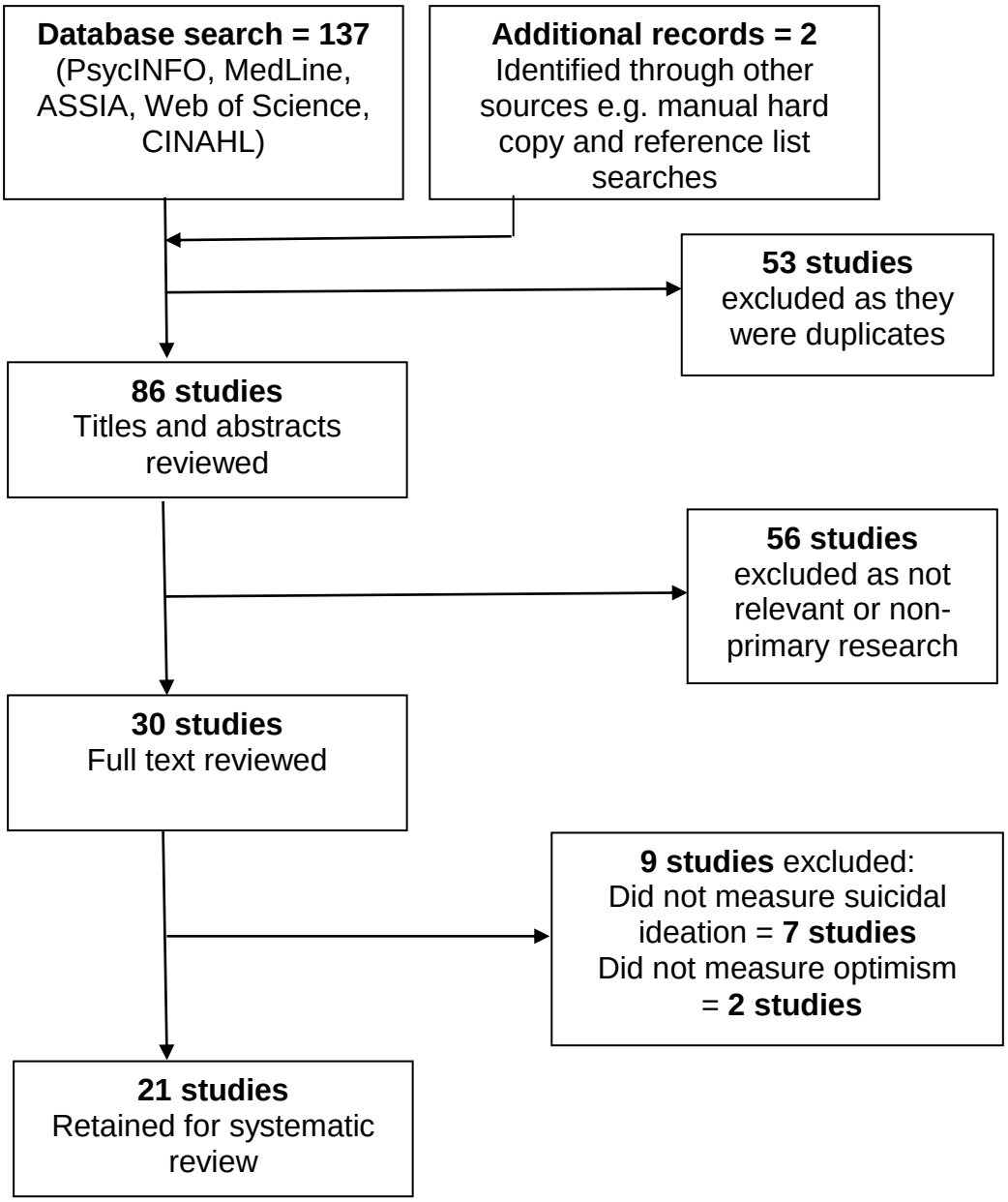
1.3.2.3. Specific Exclusion Criteria

Studies were excluded if they: (1) did not measure SI, or used a measure with no evidence of psychometric validation; (2) did not measure optimism using a standardised measure. Studies focusing on pessimism, hopelessness or hope, were excluded, as they are considered distinct constructs (e.g. Herzberg et al., 2006); and (3) did not empirically test a relationship involving these variables, using methods such as multiple regression or mediational path analysis.

Table 1.2: Inclusion and Exclusion Criteria

Variable	Include	Exclude
Suicidality	Ideations / thoughts Standardised measure	Plans Attempts Non-standardised measure
Optimism	Standardised measure Measure of related term: positive future orientation	Non-standardised measure Measure of distinct constructs *without* optimism: Pessimism Hopelessness Hope
Relationship	Empirical test of relationship using correlational methods	No empirical test of relationship between optimism and SI
Age	18 and Older	Those under 18
Population	Culturally diverse populations	None
Mental Health Status	Any MH diagnosis OR No MH diagnosis	None
Study Design	Quantitative	Qualitative

Figure 1.1: PRISMA Flow Diagram (Moher, Liberati, Tetzlaff, Altman & The PRISMA Group, 2009)



1.3.3. Classification of Studies

The process of study selection was recorded on a 'Preferred Reporting Items for Systematic Review and Meta-analyses' (PRISMA; Moher et al., 2009) flow diagram (see Figure 1.1). In total 137 articles were initially identified from

database searches, and a further two studies were obtained from additional sources such as hard copy and reference list searches. Of these, 53 were duplicates, resulting in 86 to be considered in line with the inclusion and exclusion criteria. Following a manual review of the titles and abstracts, a further 56 records were excluded as not relevant, or as non-primary research such as case studies or commentaries. The full text for the remaining 30 were reviewed and a further nine were excluded as seven did not measure SI using a standardised measure and two did not measure optimism (or broader, related concept such as positive future orientation). This resulted in 21 relevant studies which satisfied the review's inclusion criteria and so were retained for systematic review.

1.3.4. Quality Assessment

In order to assess the quality of the 21 studies identified from the systematic review process, an assessment framework (Caldwell, Henshaw & Taylor, 2005) was used. This quality assessment tool was considered suitable for the current review as it is frequently employed in health and clinical psychology, and is simple and accessible. The framework can be used to assess both quantitative and qualitative research; however, in this review only quantitative methodologies were assessed, as per the inclusion criteria. No qualitative studies were found that examined optimism in the context of SI.

All studies were scored against 18 quality criteria. Studies were rated as 0 if the criteria was not met, 1 if the criteria was partially met, and 2 if the criteria was

fully met. The rating for each article was calculated by adding the scores for all 18 criteria, so that each article would receive a score between 0 and 36. Papers which scored a mid-point of 18 or below were excluded as not reaching a satisfactory level of rigour as determined by the quality assessment framework.

To enhance the reliability of the quality assessment process, another researcher rated three articles independently against the same quality assessment criteria and an inter-rater reliability analysis using the Kappa statistic was performed. The results (Kappa = 0.86, $p < .001$) suggested strong and significant inter-rater reliability.

The quality assessment scores for all 21 articles ranged from 20 to 35. As no score was below the mid-point of 18, all the studies were retained for inclusion in the review. However, it should be noted that the quality assessment framework highlighted that identification and justification of study design and methodology, and generalisability of results appeared to be areas of relative weakness across reviewed studies. It also highlighted one study's (Abdel-Khalek & Lester, 2002) relatively poorer quality, with an overall score of 20. These potential limitations should be held in mind when interpreting the results of this review. See Appendix B for details (page 144).

1.3.5. Characteristics of Studies

A summary of the key characteristics of the 21 studies included in this review can be found in Table 1.3 below. Of the 21 studies identified for review, six were conducted by Hirsch and colleagues. Nineteen studies used a cross-sectional design, with the two remaining studies adopting a longitudinal design. All studies reviewed adopted a quantitative methodology using self-reported, fixed response measures. Student samples were utilised in 11 of the studies, clinical samples in seven, and community samples of particular groups in three (trans adults [identifying as transgender, trans-sexual, etc.] and two caregiver samples).

Of the targeted variables, SI was measured using the Beck Scale for Suicidal Ideation (BSSI; Beck & Steer, 1991) in the majority of instances (11), with other studies utilising briefer, psychometrically valid measures of SI such as the Suicidal Ideation Questionnaire (Reynolds, 1987), Suicide Probability Scale (Cull & Gill, 1988), Suicidal Behavior Questionnaire-Revised (SBQ-R; Osman et al., 2001), and suicidality-specific subscales of the Depressive Symptom Inventory (DSI-SS; Metalsky & Joiner, 1997) and the General Health Questionnaire (GHQ; Goldberg & Hillier, 1979).

Of the reviewed studies, 17 conceptualised optimism as a stable, trait-like disposition and one conceptualised optimism as an attributional style. This was reflected in their measurement of optimism; with most (14) using the Life Orientation Test (LOT; Scheier & Carver, 1985) or its revised version (LOT-R;

Scheier et al., 1994) to measure optimism. Two studies focused instead on a tendency towards positive future cognitions more generally; termed “positive future orientation”. This was thought to be relevant to the present study as it incorporates optimism, yet is considered to go beyond the construct, also encompassing related constructs such as hope (Hirsch et al., 2006; Hirsch et al., 2007). One further study measured optimism as both a disposition and an attributional style (Hirsch & Conner, 2006).

Most studies (17) examined the relationship between optimism and SI using regression models. As such, they used values of optimism, alongside values of variables like depression, hopelessness, rumination, etc., to predict levels of SI. The relative strengths of each predictor variable inform understanding about how these variables are associated with SI. For instance, how optimism may be directly associated with SI, and how optimism may moderate, or be moderated by, other variables in its relationship with SI. Moderator variables influence the strength or direction of a relationship between an independent variable and a dependent variable (Baron & Kenny, 1986). Mediated associations between optimism and SI were also examined, using mediational path analysis (Ballard, Patel, Ward & Lamis, 2015; Feng, Li & Chen, 2015). Mediator variables explain the relationship between an independent and dependent variable (Baron & Kenny, 1986). Optimism was also used to distinguish between suicidal and non-suicidal participants, using multivariate analysis of variance (Rosengard & Folkman, 1997) and t-tests (Sanchez-Teruel, Garcia-Leon & Muela-Martinez, 2013).

Table 1.3: Characteristics of Studies

Authors Location	Year	Study Aims	Design	Sample population	Variables	SI/Optimism Scales	Key findings	Quality Rating
Abdel-Khalek & Lester USA & Kuwait	2002	To investigate whether personality can predict suicidality in two cultures	Cross sectional	460 students in Kuwait (77.6% female, M age = 21.9; SD = 3); and 273 students in USA (77.7% female, M age = 23.2; SD = 6.5)	SI, optimism and pessimism, adherence to Taoist orientation, death obsession, anxiety, obsession-compulsion	SIQ, ASOP	Optimism was among the predictors of SI in American sample, but not in the Kuwaiti sample. Across both samples, pessimism, anxiety and death obsession seem to be the strongest predictors.	20
Amer & Hamdan-Mansour Jordan	2014	To investigate psychosocial predictors of SI in patients with chronic illnesses	Cross sectional	442 patients with either diabetes, CVD, or cancer (39.1% female, M age = 44.5, SD = 16.4)	SI, optimism, depression, satisfaction with life, perceived social support	GHQ-SS, LOT-R	Optimism and depression were significant predictors of both components of SI (ideation about motivation and ideation about preparation). However, after demographics controlled, both continued to predict motivation SI, but only depression continued to predict preparation SI.	30

Ballard et al. USA	2015	To investigate relationship between optimism, depressive symptom clusters and SI	Cross sectional	140 students (77.9% female, 18-26 yrs, M = 20.1, SD = 1.7)	SI, optimism, depression	BSSI, FDI	No direct path found between optimism and SI. However, subjective depression mediated between optimism and SI.	34
Bryan et al. USA	2013	To investigate impact of optimism on SI and on effects of depression, trauma and hopelessness on SI	Cross sectional	97 active duty Air Force personnel (39.2% female, 21-54 yrs, M = 34.1, SD = 8.7)	SI, past SA, optimism, depression and PTSD	BSSI, FDI	Optimism was associated with less severe SI. Optimism weakened the relationship between hopelessness and SI, but the same moderating effect did not exist between depression and SI and PTSD symptoms and SI.	31
Chin & Holden Canada	2013	To investigate impact of optimism and future time perspective on SI in high-risk college sample	Cross sectional	87 students (79.3% female, 17-23 yrs, M = 18.2, SD = 0.8)	SI, optimism, depression, hopelessness, psychache (psychological pain from unmet needs), future thinking and future connectedness	BSSI, LOT-R	Optimism weakened the relationship between depression and SI (ideation about motivation only, not ideation about preparation), and the relationship between hopelessness and SI (ideation about motivation only, not ideation about preparation) among high-risk students.	26

Davidson & Wingate USA	2013	To investigate impact of hope and optimism on interpersonal suicide risk and SI	Cross sectional	60 MH clinic outpatients (61.7% female, 18-69 yrs, M = 26.2, SD = 9.6)	SI, optimism, thwarted belongingness, burdensomeness, acquired capability for suicide, depression, anxiety, hope	HDSQ-SS, LOT-R	Both optimism and hope predicted lower levels of burdensomeness and thwarted belongingness, but were not significant predictors of SI. Optimism was a stronger predictor of interpersonal suicide risk than was hope.	30
Feng et al. China	2015	To investigate impact of self-efficacy and optimism on stress and SI	Cross sectional	296 rehab patients (68.9% female, 23-46 yrs, M = 33.8, SD = 4.5)	SI, optimism, perceived stress, self-efficacy	BSSI, LOT-R	Optimism and self-efficacy partially mediated the relationship between stress and SI. High optimism and self-efficacy negatively predicted SI.	30
Hirsch & Conner USA	2006	To investigate impact of optimism on relationship between hopelessness and SI	Cross sectional	284 students (65.1% female, 18-57 yrs, M = 21.0, SD = 4.6)	SI, optimism, depression, hopelessness	BSSI, LOT-R, EASQ	Optimism weakened the relationship between hopelessness and SI. This moderation effect was found for explanatory style optimism, but not dispositional, trait-like optimism.	29
Hirsch et al. USA	2006	To investigate association of future orientation with SI and SA	Cross sectional	202 depressed patients (57.4% female, 50-88 yrs, M = 61.7, SD = 10.6)	SI, SA, positive future orientation, depression, hopelessness	BSSI, RFLI	Positive future orientation was associated with reduced likelihood of SI, after accounting for the effects of age, gender, hopelessness and depression.	27

Hirsch, Conner & Duberstein USA	2007	To investigate impact of optimism on SI	Cross sectional	284 students (65% female, 18-57 yrs, M = 21.0, SD = 4.6)	SI, optimism, depression, hopelessness	BSSI, LOT-R	Optimism was associated with reduced SI. Effects maintained after controlling for depression and hopelessness.	29
Hirsch, Duberstein, et al. USA	2007	To investigate effect of hopelessness and positive future orientation on functional status and SI	Cross sectional	136 depressed patients (58.1% female, M = 66.6, SD = 9.7)	SI, positive future orientation, depression, hopelessness, burden of physical illness, functional status	BSSI, RFLI	Positive future orientation weakened the relationship between functional impairment and SI in a sample of depressed patients.	31
Hirsch, Wolford, et al. USA	2007	To investigate effect of optimism on negative life-events and SI	Cross sectional	138 students (72.5% female, 18-57 yrs, M = 22.5, SD = 6.1)	SI, optimism, depression, hopelessness, negative life events	BSSI, LOT-R	Optimism weakened the relationship between negative life-events and SI. However, as negative life-events increase, those with highest levels of optimism were at greatest risk of SI.	30
Hirsch et al. USA	2009	To investigate effect of optimism on negative life-events and SI	Cross sectional	138 students (72.5% female, 18-57 yrs, M = 22.5, SD = 6.1)	SI, optimism, depression, hopelessness	BSSI, EASQ	Optimism weakened the relationship between negative life-events and SI; those with a more optimistic explanatory style were less likely to express SI as a result of negative life-events.	28

Moody & Smith Canada	2013	To investigate suicide protective factors in trans adults	Cross sectional	133 trans adults (18-75 yrs, M age = 36.8, SD = 13.0)	SI, SB, optimism, perceived social support, suicide resilience, reasons for living	SBQ-R, LOT-R	Optimism was significantly negatively correlated with SI. However, optimism was not a significant predictor of SI once other variables accounted for. Strongest predictors of SI were perceived social support, emotional stability and reasons for living (related to children).	32
O'Connor et al. UK	2008	To compare the power of positive future expectancies and global hopelessness in SI prediction.	Longitudinal	237 outpatients following episode of self-harm (63.7% female, 16-73 yrs, M = 36.9, SD=13.0)	SI, optimism, depression, anxiety, hopelessness, suicide intent	SPS, FTT	Optimism was a stronger predictor of Time 2 SI independent of age, sex, baseline mood and baseline SI than was hopelessness. Pessimism was not significant predictor of T2 SI independent of optimism.	35
O'Dwyer et al. Australia	2016	To investigate the rate of SI in a large sample of dementia carers and identify psychosocial risk and protective factors.	Cross sectional	566 dementia carers (79.0% female, M age = 62.9, SD = 11.5)	SI, optimism, depression, hopelessness, anxiety, coping, social support, caregiver burden	SBQ-R, LOT	Optimism was significantly higher in the 'Non-Suicidal' group. However, optimism was not a significant predictor of SI. In carers, higher SI was linked with younger age, more depression and fewer reasons for living. Greater use of dysfunctional coping and less satisfaction with social support were associated with SI via increased depression.	34

O'Keefe & Wingate USA	2013	To investigate impact of hope and optimism on interpersonal suicide risk and SI	Cross sectional	168 American Indian / Alaskan Native students (77.4% female, 18-62 yrs, M = 23.1)	SI, optimism, thwarted belongingness, burdensomeness, acquired capability for suicide, hope	HDSQ-SS, LOT-R	Optimism negatively predicted SI, and weakened the relationship between interpersonal risk factors for suicide (perceived burdensomeness and thwarted belongingness) and SI.	32
Rasmussen & Wingate USA	2011	To investigate impact of optimism as a protective factor against SI	Cross sectional	452 students (65.6% female, 18-47 yrs, M = 19.9, SD = 3.1)	SI, optimism, depression, thwarted belongingness, burdensomeness, acquired capability for suicide	HDSQ-SS, LOT-R	Optimism negatively predicted SI, over and above the effects of depression. Optimism weakened the relationship between thwarted belongingness and burdensomeness and SI.	31
Rosengard & Folkman USA	1997	To investigate relationship between bereavement, SI and protective factors in caregivers	Longitudinal	86 HIV-positive (M age = 37 yrs) and 167 HIV-negative (M age = 39 yrs) caregiving partners of men with AIDS	SI, optimism, depression, perceived social support, coping strategies, caregiver burden	SCID, LOT	Higher optimism was associated with never having experienced SI across all participants, and in the HIV-negative group. No significant association was found for optimism and SI in those who had been bereaved or those in the HIV-positive group. However, other factors were stronger predictors of SI over time, including multiple stressors, social isolation and little social support, and inadequate coping strategies.	29

Sanchez-Teruel et al. Spain	2013	To investigate psychosocial risk factors in those with high SI	Cross sectional	40 students: 21 without SI (66.7% female, 21-33 yrs, M = 24.1, SD = 2.8); 19 with high SI (73.7% female, 21-34yrs, M = 23.7, SD = 3.3)	SI, optimism, social support, self-esteem, social skills, attributional style	BSSI, LOT-R	Those with high levels of SI scored significantly lower than those with low levels of SI on measures of optimism, self-esteem, social skills and social support.	28
Tucker et al. USA	2013	To investigate relationship between hope, optimism, SI and rumination	Cross sectional	298 students (69.1% female, 18-56 yrs, M = 19.6)	SI, optimism, depression, rumination, hope	HDSQ-SS, LOT-R	Optimism weakened the relationship between rumination and SI, as did hope.	32

Note:

AIDS: Acquired Immunodeficiency Syndrome; ASOP: Arabic Scale of Optimism and Pessimism; BSSI: Beck Scale of Suicidal Ideation; CVD: Cardio-vascular Disease; EASQ: Expanded Attributional Style Questionnaire; FDI: Future Dispositions Inventory; FTT: Future Thinking Task; GHQ-SS: General Health Questionnaire-Suicidal Subscale; HDSQ-SS: Hopelessness Depression Symptom Questionnaire-Suicidality Subscale; HIV: Human Immunodeficiency Virus; LOT / LOT-R: Life Orientation Test / LOT-Revised; M: Mean; MH: Mental Health; PTSD: Post Traumatic Stress Disorder; RFLI: Reasons For Living Inventory; SA: Suicide Attempt; SB: Suicidal Behaviour; SBQ-R: Suicide Behavior Questionnaire-Revised; SCID: Structured Clinical Interview for the Diagnostic and Statistical Manual of Mental Disorders; SD: Standard Deviation; SI: Suicidal Ideations; SIQ: Suicidal Ideation Questionnaire; SPS: Suicide Probability Scale; Trans adults: identifying as transgender, trans-sexual, etc.

1.4. Results

Following a systematic review of the evidence from the 21 studies it would appear that our understanding of the association between optimism and suicidal ideations (SI) can be organised around three key themes. Firstly, the bivariate nature of the relationship between variables in terms of their pattern of collinearity (direction and strength of association). Secondly, the multivariate nature of the relationship as defined by the influence of extraneous psychosocial variables to moderate the role of optimism as a predictor of SI. Finally, the specificity of the relationship which considers the conceptual and psychometric accuracy of the scales used to measure optimism and SI. The discussion concludes by examining whether optimism should be considered as an important factor when attempting to predict the likely onset of suicidal thoughts.

1.4.1. Bivariate Nature of the Relationship between Optimism and Suicidal Ideations

Of the 21 studies that statistically examined the association between optimism and SI, 17 reported a Pearson correlational coefficient value indicating the direction and strength of the bivariate relationship (see Table 1.4 below). Of these 17 studies, 15 reported a significant association between levels of optimism and SI; with only two studies reporting a non-significant result (Ballard et al., 2015; Davidson & Wingate, 2013). Of these two, Ballard et al.'s study was conducted using a student sample with moderate to severe depression, and Davidson and Wingate used a clinical sample accessing individual therapy.

It is possible that the non-significant results may be due to a higher level of psychological distress in these samples, reducing any protective effect of optimism. However, other studies found significant results with clinical samples (e.g., Hirsch et al., 2006), so this may not account for the difference.

The coefficients in Table 1.4 below demonstrate values ranging from -0.18 (Tucker et al., 2013) to -0.47 (Chin & Holden, 2013; Hirsch, Wolford, LaLonde, Brunk & Parker-Morris, 2009). According to Cohen (1988), these represent weak to moderate evidence of an association at best. However, the complexity of measuring abstract psychological variables should be recognised. Correlations in psychological research are rarely perfect, and reflect the complexity of measuring abstract concepts alongside a difficulty in performing true experiments and controlling for all extraneous variables (Coon & Mitterer, 2010). Nonetheless, seven studies found significant coefficient values of -0.40 or above, suggesting that there is some degree of meaningful connection between the levels of optimism and SI.

The direction of the relationship is negative, suggesting that the nature of the association is such that as levels of optimism rise, levels of SI are reduced. For example, Bryan, Ray-Sannerud, Morrow and Etienne (2013), Hirsch, Conner and Duberstein (2007), O'Keefe and Wingate (2013) and Rasmussen and Wingate (2011) found that those with greater levels of optimism were less likely to report SI. A similar finding was reported by Hirsch et al. (2006); higher levels of a form of optimism known as positive future orientation were associated with less severe SI. These findings spanned both clinical and non-clinical

populations. Conversely, people with lower levels of optimism are more at risk of experiencing SI. For example, Sanchez-Teruel et al. (2013) compared a group of students with high levels of SI with a group with low levels of SI. They found that the 'High SI' group had significantly lower optimism scores than did the 'Low SI' group.

While, typically, studies frame this relationship as optimism exerting an influence on SI, it is conceivable that the time order to the association can be the other way around. That is, that levels of suicidal thoughts are impacting on states of optimism. It may be that optimism is a stable, dispositional trait that forms early in life, and therefore precedes SI that develop later. However, it also seems intuitive that optimistic ways of explaining events can be affected by the presence of SI; as well as the distress associated with SI. The majority of these studies were cross-sectional and so firm conclusions about the time order within the optimism-SI relationship cannot be drawn. Preliminary evidence from two longitudinal studies suggests that optimism precedes SI. A baseline measure of optimism predicted SI approximately 2.5 months later (O'Connor et al., 2008); and higher optimism was associated with a reduced likelihood of ever having experienced SI, remaining a protective factor two years later (Rosengard & Folkman, 1997). However, further longitudinal research is needed to examine the time order in the relationship between optimism and SI more conclusively.

Table 1.4: Reported Correlation Coefficients between Optimism and Suicidal Ideations

Authors	Correlation coefficient	Strength
Abdel-Khalek & Lester, 2002	-0.41*** -0.33***	Moderate Moderate
Amer & Hamdan-Mansour, 2014	*ns* -0.10*	*ns* Weak
Ballard et al., 2015	*ns*	*ns*
Bryan et al., 2013	-0.32**	Moderate
Chin & Holden, 2013	-0.45** -0.47**	Moderate Moderate
Davidson & Wingate, 2013	*ns*	*ns*
Feng et al., 2015	-0.39**	Moderate
Hirsch & Conner, 2006	-0.41** -0.24**	Moderate Weak
Hirsch et al., 2006	Not reported	Not reported
Hirsch, Conner & Duberstein, 2007	-0.41**	Moderate
Hirsch, Duberstein, et al., 2007	-0.28**	Weak
Hirsch, Wolford, et al., 2007	-0.40***	Moderate
Hirsch et al., 2009	-0.47**	Moderate
Moody & Smith, 2013	-0.46***	Moderate
O'Connor et al., 2008	-0.35***	Moderate
O'Dwyer et al., 2016	Not reported	Not reported
O'Keefe & Wingate, 2013	-0.24**	Weak
Rasmussen & Wingate, 2011	-0.31***	Moderate
Rosengard & Folkman, 1997	Not reported	Not reported
Sanchez-Teruel et al., 2013	Not reported	Not reported
Tucker et al., 2013	-0.18**	Weak

Note:

* p<0.05; ** p<0.01; *** p<0.001, *ns* = non-significant

Correlation strength taken from Cohen (1988)

1.4.2. Multivariate Nature of the Relationship between Optimism and Suicidal Ideations

One of the key issues highlighted in these studies is the influence of other, extraneous variables; on optimism, on SI, and on the relationship between the two. In particular, studies considered the influence of psychological factors such as depression, hopelessness and burdensomeness, as well as the influence of life stressors and socio-demographic factors.

1.4.2.1. The Influence of Depression

Depression is well established as associated with suicidality (Keilp et al., 2012), therefore it may be expected to influence the optimism-SI relationship. Five studies examined the influence of depression; the majority of other studies statistically controlled for it. One study focused on the differential influence of particular clusters of depressive symptoms (Ballard et al., 2015). They found that subjective depression (perceptions of sadness, despair and loss of enjoyment) mediated the link between optimism and SI. A lack of optimism was associated with increased subjective depression, and in turn, this was associated with increased SI. Bryan et al. (2013) found that optimism did not weaken the relationship between depression and SI. Two studies found depression was a stronger predictor of SI than was optimism (Amer & Haman-Mansour, 2014; O'Dwyer, Moyle, Zimmer-Gembeck & De Leo, 2016). Only Chin and Holden (2013) found optimism weakened depression's effect on SI. Overall, these results suggest that depression has a stronger impact on SI than does optimism; perhaps that depression reduces optimism to an indirect or non-significant influence on SI.

It is possible, given that optimism represents positive future cognitions, that any benefits of optimism are largely limited to the cognitive domain, with less impact on the affective domain related to depression. Depression may also affect an individual's capacity to use adaptive cognitive coping strategies, which may include optimistic ways of thinking, to manage negative emotions. This may suggest that the more powerful emotional effect of depression 'cancels out' the value of optimistic cognitions. It is also possible that optimism remains important, but has a strong collinear relationship with depression. Findings support optimism's importance in the sense that it contributes unique (albeit small) variance to the prediction of SI, even after controlling for depression (e.g. Hirsch, Conner & Duberstein, 2007; Tucker et al., 2013).

1.4.2.2. The Influence of Hopelessness

Hopelessness has been considered the psychological construct most closely related to suicidality (O'Connor, Armitage & Gray, 2006). Four studies focused on hopelessness (Bryan et al., 2013; Chin & Holden, 2013; Hirsch & Conner, 2006; O'Connor, Fraser, Whyte, MacHale & Masterton, 2008). At low levels of optimism, there was a strong relationship between hopelessness and SI; that is, the more hopeless an individual viewed themselves, the more severe their suicidal ideations. However, at high levels of optimism this relationship was weakened, such that more optimistic individuals were afforded protection against SI, even when hopelessness is high (Bryan et al., 2013; Chin & Holden, 2013; Hirsch & Conner, 2006). Evidence suggests that high optimism is a more powerful predictor of later SI than is hopelessness (O'Connor et al., 2008).

Hopelessness, like optimism, works within the cognitive domain; and, in fact, cognitions typical of those with low levels of optimistic thinking may be similar to cognitions characterised by hopelessness. However, cognitions typical of high levels of optimism may be very different to hopelessness cognitions; and may act as a protective barrier against SI.

High optimism, therefore, seems to dampen down the effect of hopelessness on SI, which has implications for clinical intervention. However, hopelessness rarely, if ever, occurs in isolation. Often, hopelessness can co-occur with depression; and as discussed previously, depression may 'cancel out' any protective effect of optimism. It may be that hopelessness occurring alongside negative affect is less impacted by optimism; in which case, interventions taking a dual approach to target enhancing optimism alongside reducing depression may be effective. Given the interactive nature of cognitive-affective-behavioural systems, intuitively, changing cognitions may work to improve mood and alleviate depression. In turn, this may reduce SI.

1.4.2.3. The Influence of Burdensomeness

Joiner (2005) identified perceived burdensomeness as an 'interpersonal risk factor' for suicidality. That is, those who believe themselves to be a burden on others and that others would be better off without them are at increased risk of suicidality. Three studies considered burdensomeness (Davidson & Wingate, 2013; O'Keefe & Wingate, 2013; Rasmussen & Wingate, 2011). Again, burdensomeness and optimism are both cognitive states, and similar patterns were found as those with hopelessness. At low optimism, there was a strong

relationship between burdensomeness and SI; that is, the more of a burden an individual felt, the more severe their SI. At high levels of optimism, however, this relationship was weakened, meaning that more optimistic people were protected against SI, even when they strongly believed they were a burden (Davidson & Wingate, 2013; O'Keefe & Wingate, 2013; Rasmussen & Wingate, 2011). Taken alongside the findings on hopelessness, these results suggest that a predisposition towards optimism can have a powerful protective effect on SI, especially in the context of cognitive risk factors. High levels of optimism can weaken the negative effects of hopelessness and burdensomeness on suicidal ideations. Conversely, low levels of optimism may be a necessary factor for developing SI, particularly alongside other powerful risk factors.

The strong multicollinearity between depression, hopelessness and burdensomeness may affect results. As they are closely related with, and reciprocally affect, one another, differentiating their individual impact is difficult. This is a common challenge in psychological research, for the measurement of a complex, dynamic variable can differ from the reality of its effects. This links to later discussion of the specificity of measurement within the literature.

1.4.2.4. The Influence of Negative Life-Events

Negative life-events, for example a car accident, illness, abuse, family separation or divorce, can intuitively impact upon negative thoughts and feelings, including SI. Three studies considered the impact of such life stressors (Feng et al., 2015; Hirsch, Wolford, LaLonde, Brunk & Parker-Morris, 2007; Hirsch et al., 2009). There is some evidence that optimism not only

protects against SI in the context of such life stressors, but that it works to reduce the level of ideations as numbers of life-events increase (Hirsch et al., 2009). For those thinking more optimistically, resilience to managing stress and negative life-events is higher (Feng et al., 2015). However, findings by Hirsch, Wolford, et al. (2007) differed. While they found optimism protects against SI at low or moderate numbers of life-events, at high numbers of life-events, optimism's protective effects weakened. In fact, those with the highest optimism became at greatest risk of SI when faced with many life stressors.

This raises questions about why a higher frequency of life-events increases SI risk for more optimistic individuals, when at lower frequencies of stressors, optimism protects them against SI. Studies did not measure the influence of perceived severity of life-events on optimism and/or SI; however, it may be stressor severity, rather than frequency, which has a stronger impact. This was suggested by findings that optimism did not protect against SI in those who had experienced bereavement of a partner (Rosengard & Folkman, 1997). Alternatively, it may be that a bombardment of negative events across the course of one's life proves inconsistent to a previously held optimistic view of the world and future; creating cognitive dissonance. This may 'shatter' high optimism, leaving the individual increasingly vulnerable to distress, including SI. Further, optimistic individuals may be less likely to withdraw when faced with insurmountable obstacles, instead continuing to expel effort in the pursuit of goals. This continued effort may come at the expense of psychological well-being, and the expectation of a favourable outcome which does not happen may result in feelings of failure.

This is also relevant to consider in the context of other risk factors, as discussed above. For example, external or situational stressors can increase vulnerability to negative cognitions (hopelessness) or negative affect (depression), which may have an increased likelihood of leading to SI in the absence of optimism's protection.

1.4.2.5. The Influence of Socio-demographic Variables

Studies used disparate samples, and the majority of studies controlled for demographic factors, making comparison across socio-demographic variables difficult. However, generally the picture of age's impact on the relationship between optimism and SI is unclear. Two studies commented on the influence of age. O'Connor et al. (2008) found that optimism was a stronger longitudinal predictor of suicidal ideations than was age, suggesting age's relative weakness in predicting later SI. In contrast, O'Dwyer et al. (2016) found age to be a significant predictor of SI, whereas optimism was not. The optimism-SI relationship appeared to maintain across gender; however, most studies used predominantly female samples. One study commented on the influence of culture, reporting evidence that optimism may be lower in Arab cultures (e.g. Kuwait) than in Western cultures (e.g. United States [US]; Abdel-Khalek & Lester, 2002); however, this may reflect a difference in the way optimism is interpreted across cultures. Most studies were conducted using Western samples, so further examination of the impact of culture was not possible. From the initial evidence, it appears that any variation in the optimism-SI relationship may be due to factors other than socio-demographic variables; however,

investigation of the impact of these factors on the relationship between optimism and SI may be a focal point for future research interest.

1.4.3. Specificity of the Relationship between Optimism and Suicidal Ideations

The nature of the relationship between optimism and SI is largely determined by how the two variables are measured. If there is a lack of specificity in the measurement, this will affect the findings and their accurate interpretation. Further, as already discussed, the impact of other variables on the relationship is significant; this may not be captured, as variables such as depression and hopelessness are fluid and dynamic, and can reciprocally influence other factors.

1.4.3.1. The Meaning and Measurement of Optimism

Optimism is a broad construct. It may manifest as current explanatory style, or future expectations; may be a personality trait or learned; and may differ from situation to situation (Hirsch & Conner, 2006). Reflecting this breadth, different measures have been employed in studies. Several measures were used to target the future expectations aspect of optimism, including the Life Orientation Test, the Future Disposition Inventory, the Reasons for Living Inventory, and the Arabic Scale of Optimism and Pessimism. To target the explanatory style aspect, the Expanded Attributional Style Questionnaire was used. As well as the breadth and complexity of optimism, it may overlap with related constructs, for example, hope, hopelessness, pessimism, resilience, and purpose or

meaning in life. Depending on the aims and design of the study, it is difficult to determine what the optimism measure is, and is not, tapping into.

Of particular note, O'Connor et al. (2008) used the Future Thinking Task (FTT) in their study. The FTT involves generating potential positive and negative future events; in a specific time period but then generalising out to a broader view of the future. This study was considered eligible for this review as it was deemed that the measurement of a generalised, broader view of a positive future met the definition of optimism (a general expectation of a favourable future; Scheier & Carver, 1985). However, it may also be argued that the FTT measures hope, in its generation of examples of specific positive events in a particular time period. If this is the case, then results may need to be interpreted with caution.

Although, as per the inclusion criteria, each measure was psychometrically reliable and valid, the range of measures used may limit comparison across studies, as they may be tapping into different aspects of this broad optimism construct. This is a limitation of the literature. Understanding optimism may be facilitated by using a standardised approach to measurement. This will more easily allow for findings to be considered as a whole body of literature, the results of which could be subjected to meta-analytic techniques, rather than component parts that cannot easily (or perhaps even usefully) be combined. Further, it may be more helpful to focus on clinical utility. Attributional style may be amenable to change through intervention, whereas personality traits, by definition, are more stable and persistent. Therefore, research may more

usefully focus on optimistic attributional style and its relationship with SI or associated risk factors, rather than dispositional optimism.

1.4.3.2. The Meaning and Measurement of Suicidal Ideations

It may be that levels of optimism are associated with particular aspects of suicidal ideations. For some, SI can broadly be thought of as comprising ideations about a desire or motivation to die by suicide, as well as ideations about the planning and preparation to die by suicide (e.g. Beck & Steer, 1991). Individuals can experience one or both of these aspects of SI. The different aspects are also reflected in the measurement of SI in some instruments. For example, the Beck Scale for Suicidal Ideations (BSSI) and the General Health Questionnaire-Suicidality Subscale (GHQ-SS) can be considered as incorporating 'motivation' and 'preparation' subscales.

Two studies considered these aspects separately, and both found optimism to be related to only the 'motivation' aspect of SI, and not the 'preparation' aspect (Amer & Hamdan-Mansour, 2014; Chin & Holden, 2013). 'Preparation' ideations are considered to be more active and severe in nature. Chin and Holden (2013) suggest that optimism alone may not be sufficient to buffer the impact of more severe SI (such as those linked with preparation); but that as SI increases in severity, optimism may better work in conjunction with other protective factors, such as social support or self-esteem.

Although these studies consider motivation and preparation ideations separately, other reviewed studies consider SI as a whole. This is worthy of

note, as it may affect comparison among studies in this review. For instance, it is possible that moderate-high SI scores are largely linked with high 'motivation' ideations, but not necessarily comparably high 'preparation' ideations. It may also be possible that optimism is more strongly associated with ideations linked with a desire to die, rather than ideations about the more active stage of planning.

The difference between ideations and planning is complex. While all suicide plans involve ideations, not all ideations involve planning. Evidence suggests that individuals with different experiences along the suicidality 'continuum' may present with different characteristics and risk status (Rudd, Joiner & Rajab, 1996). Therefore, distinguishing between suicide 'planners' and 'ideators' may be important. However, no reviewed studies do this, instead seeming to present all those reporting ideation as one homogenous group.

As most studies considered SI measured on one continuous scale, it is not possible in this review to tease apart whether optimism is more strongly linked with one aspect of ideations than another. Again, this lack of standardised approach makes comparison across studies difficult, and limits the conclusions it is possible to draw from the literature.

1.5. Discussion

This discussion will focus on three key issues. First, on the significance of the main findings detailed above, and how they answer the question of: Does

optimism reduce the risk of suicidal ideations? Secondly, on the implications of the findings for policy and practice. Finally, limitations of the review and recommended future directions will be discussed.

1.5.1. Significance of the Main Findings

Broadly, the literature suggests that optimism can play a role in reducing the risk of suicidal ideations. Optimism demonstrated a negative relationship with SI; that is, greater levels of optimism were associated with lower levels of SI, and regression models found that optimism had value in terms of SI prediction. However, bivariate associations between optimism and SI appear moderate at best. Therefore, it seems likely that variables identified in the literature as having a stronger bivariate association with SI, such as depression and hopelessness, may be more effectively targeted in interventions aimed at reducing suicidality. Nonetheless, weak to moderate statistical associations can translate into meaningful clinical value, and so should not be discounted (Hirsch, Conner & Duberstein, 2007).

However, the value of optimism in relation to suicidal ideations may more usefully be understood through its multivariate associations. The relationship between optimism and SI did not appear affected by socio-demographic factors such as culture, age and gender. However, optimism was found to be impacted by psychological factors. At high levels, optimism was found to be protective against SI, even in the context of risk factors for suicidality, such as hopelessness, burdensomeness and negative life-events. In contrast, low

levels of optimism were found to increase vulnerability to SI, especially when combined with the presence of other risk factors.

There may be differences in the measurement of optimism and suicidal ideations. Different aspects of optimism, such as an optimistic disposition, an optimistic explanatory style, or a positive future orientation, may be captured by different measures. Optimism may also be related to certain aspects of SI; although data are limited, evidence suggests a stronger association with ideations related to a motivation and desire to die by suicide, than with ideations related to planning and preparation. Thus, in addressing the relationship between optimism and SI, differing measurement may limit conclusions drawn from the literature.

1.5.2. Implications for Practice and Policy

Evidence presented in this review suggests that there is value in assessing optimism prior to beginning an intervention designed to reduce suicidality. The Life Orientation Test-Revised version (LOT-R) provides a brief measure (10 items) by which clinicians can gain insight into the level of optimism of the individual client experiencing SI. This can aid risk assessment; as low optimism can increase risk of SI in the context of other suicidality risk factors. For example, if the client is experiencing high levels of hopelessness, low optimism alongside this can present increased risk. Knowledge of a client's level of optimism can aid psychological formulation, as it forms part of a clearer picture of an individual's strengths or protective factors. As with any formulation, this

can inform the intervention with the client; building on existing protective factors and/or allowing for learning new skills to develop protective factors. Emerging evidence suggests that optimism can be trained, in line with Seligman's (2011) assertion that optimism and other positive traits can be learned and cultivated. For instance, an intervention similar to the Penn Optimism Program (POP), an American programme aiming to promote optimism in school-children, may be effective for those low in optimism. The POP reported improved optimism, reduced depression and hopelessness; and the increased optimism appeared sustained over time (Hirsch & Conner, 2006). Brief measurement of optimism can also help track progress, allowing change to be captured during intervention and evaluated post-intervention.

In light of evidence of optimism's moderating impact on variables conferring risk of suicidality, a dual approach may be helpful. For example, targeting an intervention to enhance optimism alongside efforts to reduce depression may be effective in reducing SI and suicide risk (Hirsch, Conner & Duberstein, 2007).

Evidence suggests that self-related cognitions may still be developing in adolescence (Caspi & Roberts, 1999). As such, an important policy recommendation may be to promote optimism at this stage of development. In their systematic review of suicide prevention strategies, Mann et al. (2005) noted the value of college campus settings, and their existing infrastructure, in developing and implementing suicide prevention initiatives. School settings are likely to offer similar advantages. Existing resources within school settings can be harnessed to deliver group programmes designed to promote and enhance

optimism, and similar adaptive cognitive strengths, to school-aged children. Such programmes, if successful, could result in benefits broader than protection against suicidality. Optimism has been linked with adaptive health-related behaviours, resulting in improved physical health outcomes. It has also been associated with increased persistence, which could translate to higher educational attainment; as well as interpersonal problem-solving, which could translate to better social relationships (Carver, Scheier & Segerstrom, 2010).

Further, parent training programmes may promote increased optimistic explanatory or attributional style. These could work to not only increase optimism and optimistic styles within the adults attending the programme; but also for these skills to be transmitted to developing children and within families and communities. Improved abilities to explain situations and the world in a positive, optimistic fashion may protect against SI in those that attend; and could also impact positively on the wider community. Prevention of mental health difficulties has been identified as a government priority and will have a positive economic impact (Knapp, McDaid & Parsonage, 2011).

1.5.3. Research Limitations

A limitation of this review is the array of sample populations used in the studies. Samples have included students (from the general university population, from particular ethnic groups and those at higher risk of suicidality), clinical groups (mental health out-patients, active military personnel, physical health patients), and community groups (caregivers and trans-adults). The wide-range of

samples may limit accurate comparison across groups and wider generalisability of results.

Further, different measures were used, for both optimism and SI. These measurement differences may reflect differing conceptualisations of each of the constructs, as well as making the findings difficult to compare with another. The constructs measured in these studies, including optimism and SI, but also hopelessness, depression, burdensomeness, etc., are complex and multi-faceted, and their valid measurement can be difficult. For instance, Osman et al. (2010) noted that the Beck Hopelessness Scale (Beck & Steer, 1988) combines positively and negatively-worded items to obtain a single score; despite indications in the literature that hopelessness is not a uni-dimensional construct.

The majority of reviewed studies were cross-sectional in design. This precluded any causal inference, meaning that it cannot be established whether one variable causes, or leads to, another. In this case, conclusions cannot be drawn about whether higher levels of optimism cause lower levels of suicidality; only that the two are associated. Of the two longitudinal studies, optimism was found to significantly predict SI over time (O'Connor et al., 2008; Rosengard & Folkman, 1997), indicating that optimism may precede, and/or may cause, SI. However, further longitudinal studies would need to corroborate these findings before conclusions can be drawn about causality between optimism and SI.

The studies rarely consider the impact of wider social, political, environmental or family factors. Some studies incorporated real-world factors, like stress and negative life-events, and their impact into their models (Feng et al., 2015; Hirsch et al., 2007a; Hirsch et al., 2009); however, the majority neither controlled for, nor discussed, the potential impact such factors could have on mood, cognitive styles, and suicidality. As the research in this field develops, it will be important to consider these factors, as well as variables such as developmental trauma, attachment styles, and family background, more widely.

1.5.4. Future Directions

A bias exists in the suicidal literature towards vulnerability, rather than resilience, to SI and behaviours (Wingate et al., 2006). Research on factors conferring protection or resilience is much less developed than that on risk or vulnerability factors, and is still emerging (Cheavens et al., 2016); as such a relatively low number of studies met the inclusion criteria for review. Therefore, future directions would usefully extend the research into optimism and its protective effects in relation to SI.

Future research should include qualitative studies. Such studies emphasise exploring experiences and the construction and shaping of meanings (Smith, 2008). The meanings individuals assign optimism and the sense they make of it in relation to suicidal ideation would enrich the field, beyond self-report measurement producing numerical data.

In terms of further quantitative research, a gap to be addressed is the impact of socio-demographic factors on optimism, SI, and the relationship between the two. For instance, examining the impact of culture, age, gender or occupation would help answer the question of whether the optimism-SI relationship exists across different populations and groups. This review highlighted the disparate nature of the measures used to capture optimism and SI. This lack of agreement or standardisation in measurement further complicates an already complex area of research. Therefore, increased standardisation in terms of measures would aid comparison across studies, and may make it more accessible to researchers and clinicians alike. The majority of studies in this area are cross-sectional; longitudinal studies would be of great benefit in identifying the time order of variables. That is, longitudinal studies can help answer the question of whether optimism precedes SI or vice versa. Further, subsequent systematic literature reviews could broaden the focus to include other aspects of suicidality, for instance suicide attempts, to establish whether the protective effects of optimism are limited to the cognitive domain, and ideations; or whether optimism's benefits extend beyond into more behavioural aspects of suicidality. Subsequent reviews may also consider the relationship between suicidal ideations and constructs related to optimism, for example, hope or pessimism; these could inform understanding of how these constructs are working in relation to SI.

1.6. Conclusions

Evidence suggests that optimism does have a role to play in reducing suicidal ideations. Optimism is negatively associated with SI, suggesting that the higher the optimism, the less the likelihood of SI. Optimism offers protection against SI, even in the context of risk factors such as hopelessness, burdensomeness or negative life-events; however, its benefits seem stronger within the cognitive domain. Brief optimism measurement can usefully inform clinical risk assessment, formulation, intervention, and treatment progress. Interventions targeting the promotion of optimism may prove effective in reducing SI, particularly in conjunction with targeting the reduction of affective depressive symptoms. Future research might aim to standardise its approach, especially regarding measurement of optimism and SI, as this will help simplify an already complex area and facilitate comparison across studies and populations. Further examinations of the optimism-SI relationship in the context of socio-demographic factors are also needed. Qualitative methodologies and longitudinal designs can offer enhancements to the field, and such research should be explored.

1.7. References

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Chapter 2

Empirical Paper

Suicide-Specific Cognitions: Can a Pattern of Cognitive Vulnerabilities Increase the Risk of Suicidality?

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(see Appendix A for author guidelines)

2.1. Abstract

Aim: Suicidality refers to a continuum of behaviours associated with self-inflicted injury or death. A growing evidence-base indicates that a particular pattern of cognitions may underlie each of the principal stages of suicidality. This study aimed to examine whether participants at different stages across the suicidality continuum ('Nevers', 'Thinkers', 'Planners' and 'Attempters') hold different patterns of suicidal cognitions. **Method:** The study used a cross-sectional design to survey 114 clinical and non-clinical participants using a range of standardised measures, including: the Suicide Cognition Scale (SCS), Suicide Behaviors Questionnaire-Revised, Brief Resilience Scale, Ten-Item Personality Inventory, Patient Health Questionnaire-9, and the World Health Organization Quality of Life-BREF. **Findings:** Principal Axis Factor Analysis of the SCS provided empirical support for the existence of a 'hopelessness' cognitive trait, defined by 3 factors accounting for 89% of the variance, which held that: 'life is unbearable', 'problems are unsolvable' and 'I am unlovable'. Binomial Logistic Regression formulated a prediction model (accurate in 94.7% of cases) in which suicidality risk was represented by high levels of hopelessness, low levels of resilience and the presence of emotionally unstable personality traits. Multiple Analysis of Variance showed depression has a significant impact on suicidality as a main effect and a complex relationship with the cognitive risk prediction model of suicidality. **Conclusion:** Patterns of cognition may play an important role in predicting suicidality risk. Cognitive behavioural therapies may be usefully targeted towards addressing cognitive hopelessness and declining levels of resilience during the planning stages of

suicidality. This may provide a way forward in terms of risk identification, primary prevention and early intervention.

Keywords: suicidality, cognitions, beliefs, hopelessness, risk

2.2. Introduction

2.2.1. Defining Suicidality

Suicidality encompasses the totality of suicide-related thoughts and behaviours: suicidal ideation; suicide planning; and self-inflicted, potentially injurious behaviours related to suicide attempts and death by suicide (Rudd, 2006; Silverman, Berman, Sanddal, O'Carroll & Joiner, 2007a; Wenzel, Brown & Beck, 2009). Suicidality refers to a continuum, to which suicidal ideation (SI) is often considered the logical 'gateway' (Beck, Kovacs & Weissman, 1979; Mann, Waternaux, Haas & Malone, 1999).

Suicidal ideations (SI) are "any self-reported thought of engaging in suicide-related behaviour" (O'Carroll et al., 1996, p.247). SI can vary from transient thoughts that life is not worth living to pre-occupation with self-destruction and concrete plans for killing oneself (Diekstra & Garnefski, 1995). As such, there exists overlap with the next stage, that of suicide planning. This involves "a proposed method of achieving a potentially self-injurious outcome" (Silverman, Berman, Sanddal, O'Carroll & Joiner, 2007b, p.265). However, though all planning involves SI, not all SI involves planning; thus suicide plans can

represent a separate aspect of suicidality. Self-injurious behaviours engaged in with the intent to end one's life are classified as a suicide attempt, if the outcome was non-fatal, or a suicide, if the outcome was fatal (Wenzel et al., 2009).

2.2.2. Suicidality: Incidence and Prevalence

It has been estimated that 0.01% of the world's population die by suicide, equating to almost a million deaths worldwide; making suicide one of the leading causes of death (World Health Organisation [WHO], 2012). Prevalence of suicide attempts has been estimated as ranging between 0.4% and 4.2% (Bertolote et al., 2005; Nock et al., 2008). Suicide attempts are more prevalent in clinical groups, with reported rates as high as 35-40% (Claes et al., 2010). Prevalence of suicide planning has been estimated to range between 1.1% and 15.6% (Bertolote et al., 2005). Nock and colleagues (2008) estimated planning prevalence as 3.1%. Lifetime prevalence of SI has been estimated to range substantially across countries, from 2.6% (Chennai, India) to 25.4% (Durban, South Africa; Bertolote et al., 2005). Another international study estimated SI prevalence as 9.2%, and reported little variation amongst high, middle and low-income countries (Nock et al., 2008). It is also noted that data across countries can be inconsistently reported and incomplete (WHO, 2012). Therefore, across all stages of suicidality, rates are likely under-reported. An accurate picture of the incidence and prevalence of suicidal planning and ideation, in particular, is unclear.

2.2.3. Suicidality, Cognitive Schemas and Systemic Modes

Cognitive theory posits that it is not objective experiences themselves, but rather our subjective perceptions and appraisals of ourselves, the world and the future which shape our response; this is known as the cognitive triad (Beck, 1976). These interpretations, if repeated over time, form enduring schemas, which guide information processing. Thus, schemas influence how individuals make sense of experiences (Clark & Beck, 2010).

One such schema is the S*uicidal Belief System*, characterised by a specific set of beliefs (Rudd, 2000). The Suicidal Belief System (SBS) includes the nature of the suicidal thoughts (e.g., frequency, duration, intensity, specific plans), the themes of hopelessness characterising their cognitive triad (negative thoughts about the self, world and future), the conditional rules and assumptions held about how suicidal thoughts can be alleviated, and compensatory strategies, or how the individual is attempting to cope with suicidal thoughts (Gibbs, 2010). The SBS is unique to each individual, but key are three core belief categories: 'unbearable', or poor distress tolerance ("I can't stand this pain anymore"); 'unsolvable', or helplessness ("my problems cannot be fixed"); and 'unlovable' ("I don't deserve to live"). These are characterised by an underlying pervasive hopelessness ("my life is hopeless").

Beck (1996) described schemas which are repeatedly activated as orienting schemas. These are dependent on an individual's own experiences and development, and can orient them to a particular way of thinking, feeling and

behaving. These schemas become increasingly accessible over time, such that the threshold for activation becomes lower and a broader range of orienting schema become relevant. Therefore, the more the SBS is activated through experience of suicidality, the more accessible and prominent it becomes. Suicide-specific cognitions become strengthened and increase one's vulnerability to difficulties linked with affective, behavioural and physiological schemas. This suggests that those with more experience of suicidality – often those further along the suicidality continuum – may therefore be increasingly vulnerable to more severe depression and impairment in functioning. As Joiner and Rudd (2000) wrote, "previous suicidal experience sensitises suicide-related thoughts and behaviours such that they later become more accessible and active" (p.909). Evidence supports this, indicating that those at different stages of suicidality can present a markedly different, and more severe, clinical picture (Rudd, Joiner & Rajab, 1996). This different presentation may be reflective of different cognitive patterns in those at varying stages across the suicidality continuum.

Collectively, schemas such as the Suicidal Belief System make up larger structural or organisational units called *modes*. Beck (1996) defined modes as "specific sub-organisations within the personality organisation [that] incorporate the relevant components of the basic systems of personality: cognitive (or information processing), affective, behavioural, and motivational" (p.4). Essentially, the mode is an inter-related network of systems which reciprocally influence one another and which act in synchrony in response to external demands and in pursuit of internal goals (Beck, 1996; Rudd, 2000). Beck

suggested that different modes (e.g. fear mode, depressed mode) become activated under specific conditions, and that repeated activation of a mode would lower the threshold for future activation.

Rudd (2000) built on this theory of modes, proposing the existence of a *suicidal mode*; activated when one experiences suicidality (see Figure 2.1 below). Based upon the basic premise of the diathesis-stress model (Schotte & Clum, 1982), Rudd argued that faulty cognitive constructions, which vary based on early experiences and/or psychological distress, can predispose an individual to vulnerability to suicidality. External (e.g. events, circumstances) or internal (e.g. thoughts, emotions, images) triggers result in orienting schemas which activate the SBS. Once activated, the SBS triggers the other suicidal mode systems into operation.

Figure 2.1: The Suicidal Mode (taken from Rudd, 2000)

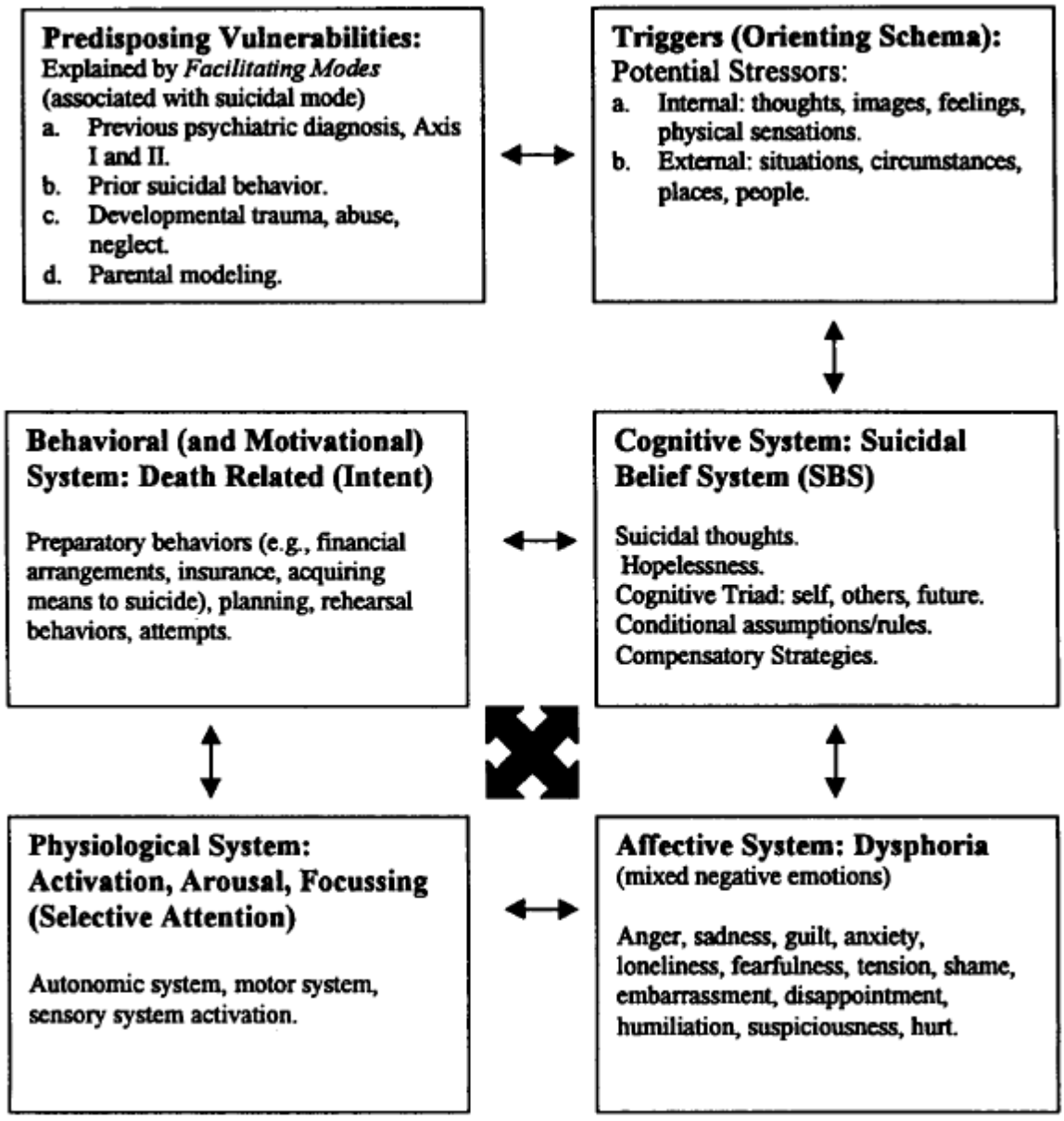


Figure 2. A CBT model of suicidality: The suicide mode.

Alongside the cognitive SBS, the affective, behavioural and physiological components of the mode work in synchrony. The suicidal affect system is characterised by mixed, dysphoric emotions and can determine the intensity of, and tolerance for, emotional pain. The behavioural system facilitates the response to suicidal thoughts. In the suicidal mode, it is characterised by intent

for death and escape. It may include impulsive reactions, maladaptive coping, preparatory or rehearsal behaviours, or suicide attempts. The suicidal physiological system involves activation of arousal symptoms, for example, agitation, impaired attention and concentration, or insomnia (Gibbs, 2010).

Other psychological factors associated with suicidality can be understood within the suicidal mode framework. The link between suicidality and depression is well established (Beck, Steer, Beck & Newman, 1993). Depression can be understood as both influenced by, and influencing, the SBS. For instance, cognitions centred around hopelessness and unlovability may lead to difficulties in the affect system characterised by mixed negative emotions such as sadness, guilt, anger and shame, as well as behavioural avoidance or withdrawal and physiological symptoms such as fatigue or loss of appetite. In turn, activation of these systems can have a reciprocal effect on increased cognitions about hopelessness and unlovability. Personality traits such as neuroticism, extraversion and perfectionism have been linked with suicidality (Brezo, Paris & Turecki, 2006; Hewitt, Flett & Weber, 1994). Within the suicidal mode, personality traits reflect enduring schema which can orient an individual to more frequent, and easier, activation of the suicidal mode. Further, lower levels of satisfaction with one's life and resilience are also relevant to suicidality (Chioqueta & Stiles, 2007; Roy, Sarchiapone & Carli, 2007). In the context of the suicidal mode, cognitions linked with, for instance, the unbearability or unsolvability of difficulties can influence behavioural or emotional responses.

The suicidal mode also integrates well with other theories. For instance, suicidality has been conceptualised as an escape; for Baumeister (1990), the escape was from painful self-awareness, whereas for Shneidman (1993) it was from intolerable psychological pain ('psychache') caused by unmet or frustrated needs. Rudd (2000) noted that these theories could be understood as each emphasising a particular system or component within the suicidal mode. For example, Baumeister describes a focus on the cognitive schemas, i.e., perceptions and awareness of the self, while Shneidman focuses more on affective schemas, i.e. emotional pain.

2.2.4. Rationale

Cognitions can be considered the central pathway to suicidality (Rudd, Joiner & Rajab, 2001; Weishaar & Beck, 1990). Rudd's Suicidal Belief System reflects a chronic and trait-based cognitive style. Rudd (2000) argued that the hopelessness underlying these cognitions is therefore also trait-like, and it is this trait-hopelessness that poses one of the greatest risks in terms of suicidality. Identification of those with trait-hopelessness, as reflected by the suicide-specific cognitions detailed by Rudd (2000), may be key in effective intervention. Further, understanding the variable nature of groups demonstrating different aspects of suicidality is likely to equip more precise risk assessment, more efficient prediction of subsequent suicidal behaviours, and more effective intervention (Rudd et al., 1996).

This study therefore aimed to answer the following three questions:

- Does there exist a specific cognitive belief system characterised by a pervasive sense of hopelessness?
- Does the belief system differ across different levels of suicidality?
- Can a risk prediction model of suicidality be formulated using patterns of suicide cognitions and other known suicidality risk factors such as depression, resilience, personality, and life satisfaction?

2.3. Method

2.3.1. Research Design

The current study was in the form of a cross-sectional survey design. It employed the structured questionnaire data gathering technique, organised around a schedule containing a series of specific statements and Likert-type response categories designed to collect quantitative data. The cross-sectional approach enabled a mass of quantitative data to be collected over a wide-ranging population.

The questionnaire measure consisted of six psychometrically tested self-report scales: measuring suicidality, the Suicide Cognitions Scale (SCS; Rudd, 2007); and Suicide Behaviours Questionnaire-Revised (SBQ-R; Osman et al., 2001); measuring resilience, Brief Resilience Scale (BRS; Smith et al., 2008); measuring personality, Ten-Item Personality Inventory (TIPI; Gosling et al., 2003); measuring depression, Patient Health Questionnaire-9 (PHQ-9; Spitzer,

Kroenke, Williams & Patient Health Questionnaire Primary Care Study Group, 1999); and measuring life satisfaction, items taken from the World Health Organization Quality of Life assessment-BREF (WHOQOL-BREF; WHOQOL Group, 1998). Demographic information (age, gender, educational qualification, marital status and mental health diagnosis) was also collected. Taken together, these factors represent many of the key causal cognitive and affective markers of suicide.

A non-probability sampling design in the form of the quota sampling method was used in order to ensure maximum variation across the different suicidality groups within the sample population. In total, 114 participants were surveyed, divided across four different stages of suicidality: Nevers; Thinkers; Planners; and Attempters.

The data were analysed in two stages using factor analysis (Principal Axis Factoring) and multivariate (Binary Logistic Regression) statistics. The results were presented in a variety of ways including the use of correlational, cross-tabular and graphical formats in order to address the key questions defining the aims of this study.

2.3.2. Participants

The study's sample population was defined by the concept of suicidality discussed previously. As such, quota sampling was used in order to ensure maximum variation across each of the principal stages along the suicidality

continuum. That is, from participants who have never considered suicide as a solution to life's problems through to those who have attempted, deliberately but unsuccessfully, to kill themselves.

The sampling quotas were organised around four groups labelled:

- 'Nevers' – participants who had never considered suicide as an option;
- 'Thinkers' – participants who have experienced suicidal ideations;
- 'Planners' – participants who have planned methods of committing suicide;
- 'Attempters' – participants who have deliberately attempted to commit suicide.

The aim was to have a broadly even number of participants within each group. Attempts were also made to ensure that the groups were broadly matched in terms of key socio-demographic factors, especially age and gender. Question 1 of the SBQ-R was used in order to differentiate participants across the four groups: i.e., "Have you ever thought about or attempted to kill yourself?"

The total scale score, which predicts level of suicidal risk, was used to confirm each participants' allocation to a group. Thus, participants allocated to the 'Planners' group, on the basis of their response to Question 1, had their position confirmed if their overall level of suicidal risk was higher than participants in the 'Nevers' and Thinkers' groups but lower than for participants allocated to the 'Attempters' group.

In order to ensure maximum variation across the four suicidality groups, participants were recruited from both clinical and non-clinical populations. The aim was to obtain quotas of 'Nevers' and 'Thinkers' from non-clinical participants and quotas of 'Planners' and 'Attempters' from clinical participants.

Clinical participants were recruited from an acute day service managed by a Midlands National Health Service (NHS) Trust. This acute day service provides treatment and therapeutic support, within a community, rather than in a hospital, setting to those experiencing a mental health crisis and who, in many instances, have a history of either planning or attempting to commit suicide.

The principal inclusion criteria for clinical participants was that they had experienced some degree of suicidality during their lifetime; to have had a history of thinking about, planning or attempting to kill themselves

The non-clinical participants were broadly divided between being drawn mainly from a University post-graduate population and the wider general public. Several criteria governed participants' inclusion in the study. Firstly, participants must have had no history of suicidality during their lifetime beyond experiencing suicidal thoughts. As such, participants could be allocated to either the 'Nevers' or 'Thinkers' research groups. Secondly, participants must have broadly matched the age and gender distribution obtained within both the 'Planners' and 'Attempters' quotient groups. And, thirdly, participants have not had significant mental health problems during their lifetime.

Broader inclusion criteria were also set up for both the clinical and non-clinical populations. That is, participants must be over 18 years old, able to speak English, and have sufficient insight and capacity at the time of the study to be able to provide informed consent (see Table 2.1 below).

Potential participants were excluded if they were considered to be currently experiencing a high risk of suicidal behaviour, as determined by the Service Manager, and presenting with a very high total score on the SBQ-R.

A strategy was set up to include any potential participant who could not read or who had difficulties reading. In such cases the key researcher would assist in the completion of the questionnaire by conducting a structured interview.

Table 2.1: Inclusion and Exclusion Criteria

Inclusion Criteria	**Exclusion Criteria**
At least 18 years of age	Under 18 years of age
Fluent in English	Not fluent in English
Able to give informed consent	Lacking insight or capacity to give informed consent
Clinical pop: some lifetime experience of suicidality	Current or high risk of suicide
Control pop: no formal diagnosis and never had experience of suicidality	

2.3.3. Materials

The questionnaire measure was designed to develop the first principles of a cognitive model of suicidality. The specific aim was to examine whether participants at different stages across the suicidality continuum (Nevers,

Thinkers, Planners, Attempters) hold different patterns of suicide cognitions. Towards this goal, the measuring instrument was formed around six psychometrically tested self-report scales (see Appendix C for further psychometric details on each).

Each variable was measured as follows:

2.3.3.1. Demographic Information

Several relevant demographic variables were collected, including age, gender, educational qualification, relationship status and mental health diagnosis of the clinical participants. Given the association of these variables to suicidality, they were considered relevant to the present study. Age in years was measured as opposed to date of birth so as to limit the amount of identifiable data collected. See Appendix D.

2.3.3.2. Suicide Behaviours Questionnaire-Revised (SBQ-R)

The SBQ-R (Osman et al., 2001) is a 4-item measure asking participants to report their experience of suicidal ideation, planning and attempts. The SBQ-R has been found to be a reliable and valid measure for use with clinical and non-clinical, and adult and adolescent, samples (Gibbs, 2010; Osman et al., 2001). See Appendix E for the scale.

2.3.3.3. Suicide Cognitions Scale (SCS)

The SCS (Rudd, 2007) is an 18-item self-report measure that assesses suicide-specific cognitions. These are characterised by hopelessness, and typically

reflect core beliefs that life is ‘unbearable’ (e.g. “When I get this upset, it is unbearable”), problems are ‘unsolvable’ (e.g. “No one can help solve my problems”), and the individual is ‘unlovable’ (e.g. “I am completely unworthy of love”). Participants rated their level of agreement with each statement using a 4-point Likert scale. Total scores range from 18 to 72, and higher scores indicate greater suicide-specific hopelessness. The SCS has been found to be a reliable and valid measure (Gibbs, 2010; Slee, Spinhoven, Garnefski & Arensman, 2008). See Appendix F for the scale.

2.3.3.4. Brief Resilience Scale (BRS)

The BRS (Smith et al., 2008) is a 6-item, self-report measure of resilience, defined as the ability to bounce back, cope and function well despite adversity or stress (Rutter, 1993). Participants rated their level of agreement with each statement using a 4-point Likert scale. Total scores range from 6 to 24, and higher scores indicate greater resilience. The BRS is a reliable and valid measure (Smith et al., 2008). See Appendix G for the scale.

2.3.3.5. Ten-Item Personality Inventory (TIPI)

The TIPI (Gosling et al., 2003) is a 10-item, self-report measure of the Big-Five Personality Dimensions (Extraversion, Agreeableness, Conscientiousness, Emotional Stability/Neuroticism, and Openness to Experience). Participants rated their level of agreement with each statement using a 4-point Likert scale. It has established reliability and validity (Gosling et al., 2003). See Appendix H for the scale.

2.3.3.6. Patient Health Questionnaire-9 (PHQ-9)

The PHQ-9 (Spitzer, Kroenke, Williams & Patient Health Questionnaire Primary Care Study Group, 1999) is a self-report, 9-item measure of depressive symptoms and their impact on an individual. Total scores range from 0 to 27. Cut-off scores indicating mild (5), moderate (10), moderately severe (15), and severe (20) depression. The PHQ-9 is a reliable and valid measure (Kroenke, Spitzer & Williams, 2001). See Appendix I for the scale.

2.3.3.7. World Health Organization Quality of Life assessment-BREF (WHOQOL-BREF)

Ten items from the self-report WHOQOL-BREF (WHOQOL Group, 1998) were used. Broadly, the items cover life satisfaction across physical and psychological health, social relationships and environment domains. Participants rated their level of agreement with each statement using a 4-point Likert scale. See Appendix J for the scale.

Some measurement scales were adjusted by removing the 'Neutral' mid-point option on the Likert scale and standardising scales to a four-point scale, ranging from 'Strongly Disagree' (1) to 'Strongly Agree' (4). The SCS, BRS and WHOQOL-BREF were originally designed on a 5-point Likert scale, and the Ten-Item Personality Inventory on a 7-point Likert scale. This decision was taken as evidence suggests respondents can be influenced towards selecting a 'Neutral' option by ambivalence, lack of motivation, and social desirability (Garland, 1991; Johns, 2005; Krosnick et al., 2002). Respondents may want to avoid the cognitive effort of selecting between conflicting opinions, or even processing the information in the first place, and may want to appear helpful or

avoid giving less socially acceptable answers, particularly in relation to sensitive topics (e.g. Garland, 1991). Krosnick et al. (2002) argued that omitting a 'Neutral' mid-point did not negatively impact data quality. For instance, following pre-tests of the scales, it was noted that the results were producing a 'response set' located around the mid-point. Omitting the mid-point may avoid this, and may better allow for measurement of meaningful responses. The relative merits of including a mid-point, and how these mid-points are interpreted, have been long-debated in the methodological literature, without any firm conclusions (Garland, 1991)

It is acknowledged that omitting a 'Neutral' option on the measurement scales may not allow truly neutral or uncertain responses to be captured, and may have affected the data. Further, removing the mid-point could have put more pressure on participants as it 'forced' them to agree or disagree. However, the change was not considered overly detrimental and was ethically approved. It was considered that the value of avoiding the 'Neutral' option as a "dumping ground" for uncertain answers (Kulas, Stachowski & Haynes, 2008, p.251) was greater than failing to capture any truly neutral positions. It was also determined that standardising the measures in the full battery of questionnaires as much as possible would enable easier completion, reducing the demands on participants.

2.3.4. Procedure

Participants were given an Information Sheet about the study (Appendix K & L) and were given the opportunity to ask questions. Informed written consent was obtained (Appendix M). All participants completed the 4-item SBQ-R to screen for study suitability. Participants then completed the structured self-report questionnaires (see above). Immediately after taking part, participants were provided with debriefing information, which included sign-posting information for subsequent support if required (Appendix N). Participation took approximately 30 minutes.

2.3.5. Ethical Considerations

Ethical approval was granted by Coventry University (see Appendix O) and a NHS Research Ethics Committee (Appendix P). The study was registered with the appropriate NHS Research and Development (R&D) department (Appendix Q). The research was designed in accordance with guidance by the British Psychological Society (BPS, 2010).

Participants were assured that taking part was voluntary, that they could decline or withdraw from the study without giving a reason, and that any current or future support services they receive would not be affected. This was made explicit in the Information Sheet as well as verbally. Participants who required more support, for example due to literacy or visual difficulties, were given the option of completing the study verbally with the researcher. Participants were

offered the option of taking a break whilst completing the questionnaires. Informed written consent was gained from those who agreed to take part. Participants were assigned a unique numerical identifier to preserve anonymity of responses; further, data were collated so it was not possible to identify individuals in the study.

2.3.5.1. Managing Risk

Given the nature of the study, it was necessary to consider potential risks of psychological harm to the participants, so as to minimise any distress associated with sensitive topics such as suicidality and depression. Participants were advised to carefully consider their decision, and were given the opportunity to discuss participation with the researcher; or, if preferred, a friend, family or staff team member. Consent included an agreement to inform the participants' GP of their participation. Clinical participants also agreed to inform the acute day service. It was considered helpful to inform relevant services of the study, as this information may aid risk management.

All participants were screened using the 4-item SBQ-R to assess study suitability. This measure also highlighted any current issues of risk and allowed for this to be addressed further. In the case of clinical participants expressing current suicidality, the staff team were made aware of the risk. As part of their routine clinical care, their psychological needs were regularly assessed and monitored. In the case of control participants expressing current suicidality, they were supported to access appropriate student services such as Student Welfare and given relevant sign-posting information.

2.3.6. Analysis

Descriptive and inferential statistical analysis was completed using SPSS (version 22; IBM Corp, 2013). To investigate the underlying factor structure of the SCS, Principal Axis Factor Analysis was used. This is a method of extracting underlying processes that have created correlations among the variables (Tabachnick & Fidell, 2013). To confirm that the SCS is tapping into a particular cognitive pattern under different suicidal conditions, an Independent Between Groups One-Way Analysis of Variance (ANOVA) was used. This tested for significant mean SCS score differences in the four suicidality groups. Post-hoc tests were used to find out where any differences lay. To examine the inter-relationship between levels of suicide-cognitions and levels of depression across the four suicidality groups, an Independent Between Groups Two-Way ANOVA was used. Again, post-hoc tests were used to find out where any differences lie. To test the predictive model of suicidality, Binary Logistic Regression was used; participants were divided into a combined 'Planners' and 'Attempters' (i.e. 'suicidal') group, as compared with a combined 'Nevers' and 'Thinkers' (i.e. 'non-suicidal') group.

A power analysis was undertaken, involving checking samples for validity in terms of size, normality of distribution and homogeneity of variance. Where appropriate, the alpha level was adjusted to a more stringent level, and stricter statistics used. This increased the power, or accuracy, of the statistics run on the data collected, and reduced the possibility of making a Type I or Type II error. See Appendix R for details.

2.4. Results

2.4.1. Demographics

A total of 114 participants (49.1% males and 50.9% females) completed this study, aged between 18 and 78 years (M = 41.24, SD = 15.87). This study aimed for a broadly even number of participants in each of the four suicidality groups. This was confirmed by a Chi-Square non-significant value χ^2 (3, *N*=114) = 5.09, p = .165, indicating that no over-sampling had occurred, and so the groups were treated as equal in the analysis. See Table 2.2. below for frequencies.

Table 2.2: Frequency Across Suicidality Groups

SBQ01: Lifetime ideation or attempt

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Never	34	29.8	29.8	29.8
	Just a brief passing thought	23	20.2	20.2	50.0
	Had a plan at least once	22	19.3	19.3	69.3
	Have attempted to kill myself	35	30.7	30.7	100.0
	Total	114	100.0	100.0	

No significant differences were found between the four suicidality groups in terms of gender, age (using a median cut-off of 37 years) or relationship status (in or out of a relationship). There was a significant difference between the four suicidality groups in relation to education χ^2 (3, *N*=114) = 30.23, p < .001. Those without higher education were significantly more likely to have attempted suicide than those with higher education. However, if education was an important causal factor of suicidality, a stronger pattern across all groups may

be expected. The significant difference in this case is likely to be a consequence of a non-random sample population; that is, the majority of the control group were taken from a post-graduate student population. Please see Appendix R for details.

2.4.2. Principal Axis Factoring

The first research question to be addressed is: Does there exist a specific cognitive belief system characterised by a pervasive sense of hopelessness? In order to answer this, Principal Axis Factoring (PAF) was conducted. The data met the two conditions of sample size and collinearity (see Bartlett's test and KMO measure in Appendix R). PAF allowed investigation of the underlying factor structure of the Suicidal Cognitions Scale (SCS). As can be seen in Table 2.3 below, the majority of the variance (83.5%) was explained by the first factor, Unbearable. The other two factors, Unsolvable and Unlovable accounted for an additional 3.3% and 2.1% of the variance respectively.

Table 2.3: Total Variance Explained by SCS Factors

Total Variance Explained

Factor	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	15.035	83.529	83.529	14.908	82.823	82.823	6.604	36.689	36.689
2	.586	3.254	86.783	.488	2.713	85.536	5.294	29.410	66.099
3	.387	2.148	88.931	.245	1.361	86.897	3.744	20.798	86.897
4	.316	1.755	90.687						
5	.302	1.678	92.365						
6	.248	1.380	93.745						
7	.214	1.190	94.934						
8	.176	.977	95.911						
9	.156	.864	96.775						
10	.110	.611	97.387						
11	.097	.539	97.926						
12	.085	.471	98.396						
13	.077	.430	98.826						
14	.056	.314	99.140						
15	.049	.275	99.415						
16	.041	.227	99.642						
17	.037	.206	99.848						
18	.027	.152	100.000						

As Table 2.4 below shows, the highlighted coefficients represent the highest across each factor, and collectively they reflect the three principal factors found in other studies (Ellis & Rufino, 2015; Gibbs, 2010). These factors are: Unbearable; Unsolvable; and Unlovable.

Table 2.4: Rotated Factor Matrix

Rotated Factor Matrix[a]

	Factor		
	Unbearable	Unsolvable	Unlovable
Getting Upset is Unbearable	.805	.404	.340
Can't Tolerate Being Upset	.780	.475	.341
Can't Cope With My Problems	.753	.487	.351
Can't Stand Pain	.747	.459	.377
Can't Withstand Pain	.711	.419	.386
Can't Describe How Bad I Feel	.705	.370	.453
Suicide Is Only Way	.469	.778	.332
Suicide Only Way To End Pain	.451	.760	.383
Rather Die	.499	.758	.328
Don't Deserve To Live	.422	.705	.505
Nothing Can Help	.502	.521	.489
Nobody Can Help Me	.501	.486	.486
Nothing Good About Me	.557	.415	.632
Nobody As Loathsome As Me	.421	.576	.590
Never Been Successful	.423	.476	.565
Better Off Without Me	.566	.494	.560
Can Never Be Forgiven	.506	.496	.511
I Am Unworthy	.593	.424	.558

Extraction Method: Principal Axis Factoring.
Rotation Method: Varimax with Kaiser Normalization.
a. Rotation converged in 7 iterations.

The three factor model of suicide-cognitions seemed to present in this sample. As the tri-factor model was extracted from the whole sample, these findings appear to indicate that these three factors may be stable and trait-like, rather than reflecting cognitions only present in a state-like suicidal crisis. Therefore, these traits may be present in everyone, but can lie dormant until activated under certain conditions (particular internal or external triggers) which increase their intensity.

2.4.3. Independent Between Groups One-Way ANOVA

The second research question to be addressed is: Does the belief system differ across different levels of suicidality? In order to answer this, an Independent Between Groups One-Way ANOVA was used. This involves one independent variable (suicidality group) with three or more levels (four groups: Nevers; Thinkers; Planners; Attempters), and one dependent variable measured on a continuous scale (Total SCS score, ranging from 18-72). As can be seen from Table 2.5 and Figure 2.2 below, there were significant differences in mean scores on the dependent variable (Total SCS) across the four groups of the independent variable.

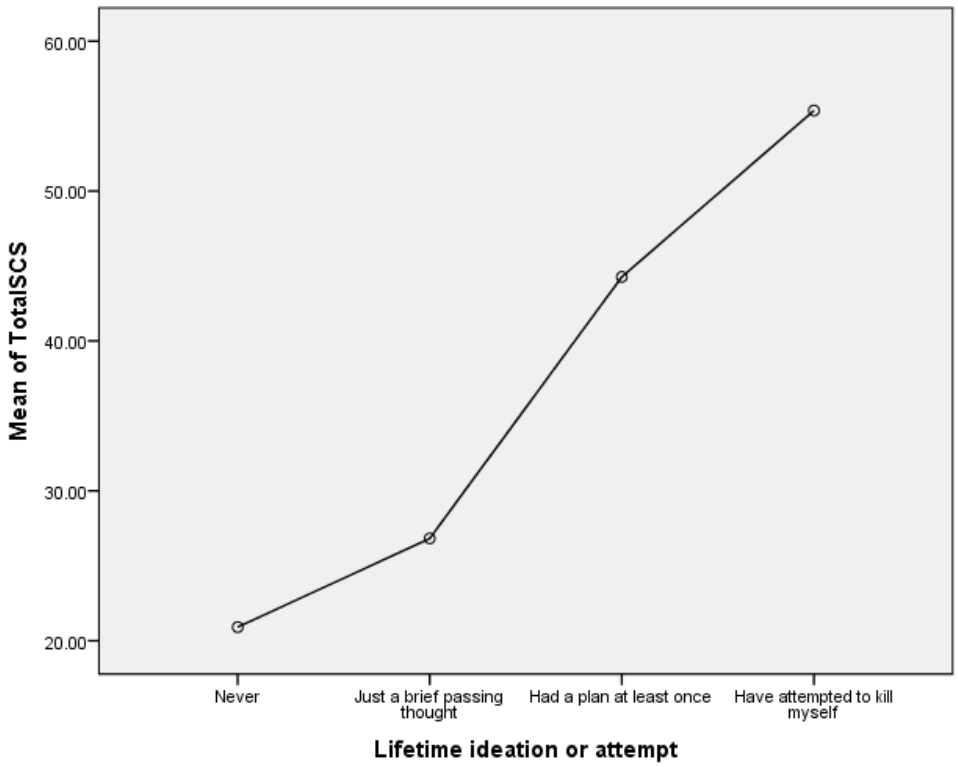
Table 2.5: Descriptive Statistics Across Suicidality Groups

Descriptives

TotalSCS

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
Never	34	20.9118	5.37315	.92149	19.0370	22.7865	18.00	37.00
Just a brief passing thought	23	26.8261	8.35927	1.74303	23.2113	30.4409	18.00	49.00
Had a plan at least once	22	44.2727	14.43601	3.07777	37.8722	50.6733	18.00	72.00
Have attempted to kill myself	35	55.3714	12.29080	2.07753	51.1494	59.5935	24.00	72.00
Total	114	37.1930	17.88749	1.67532	33.8739	40.5121	18.00	72.00

Figure 2.2: Mean SCS Score Across Suicidality Groups



As seen in Table 2.6 below, the observed mean differences between the four suicidality groups were significant F (3, 110) = 73.79, p < .001.

Table 2.6: ANOVA Results: Total SCS

ANOVA
TotalSCS

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	24153.180	3	8051.060	73.786	.000
Within Groups	12002.575	110	109.114		
Total	36155.754	113			

The data did not satisfy the assumption of homogeneity of variance between groups, as illustrated by the Levene statistic (7.64, p < .001). While the ANOVA is a robust test, in order to improve the power of the statistic, the Dunnett T3 was used. This significance test takes account of the fact that the homogeneity assumption has not been met, and allows for setting the alpha at a more

stringent level (0.01). Table 2.7 below showed that all four suicidality groups differed significantly from each other in terms of the degree of suicidal cognitions held. As participants' level of suicidality changed from Never to Thinkers, Planners and Attempters, there was a significant increase in their cognitions as characterised by the notion of a pervasive sense of hopelessness, and defined by Unbearable, Unsolvable and Unlovable factors. The difference between the Never and Thinkers group was smaller but still evident, suggesting that changes in an individual's SBS are associated with emerging thoughts about killing oneself.

Table 2.7: Post-hoc Dunnett T3 Results: Total SCS

Multiple Comparisons

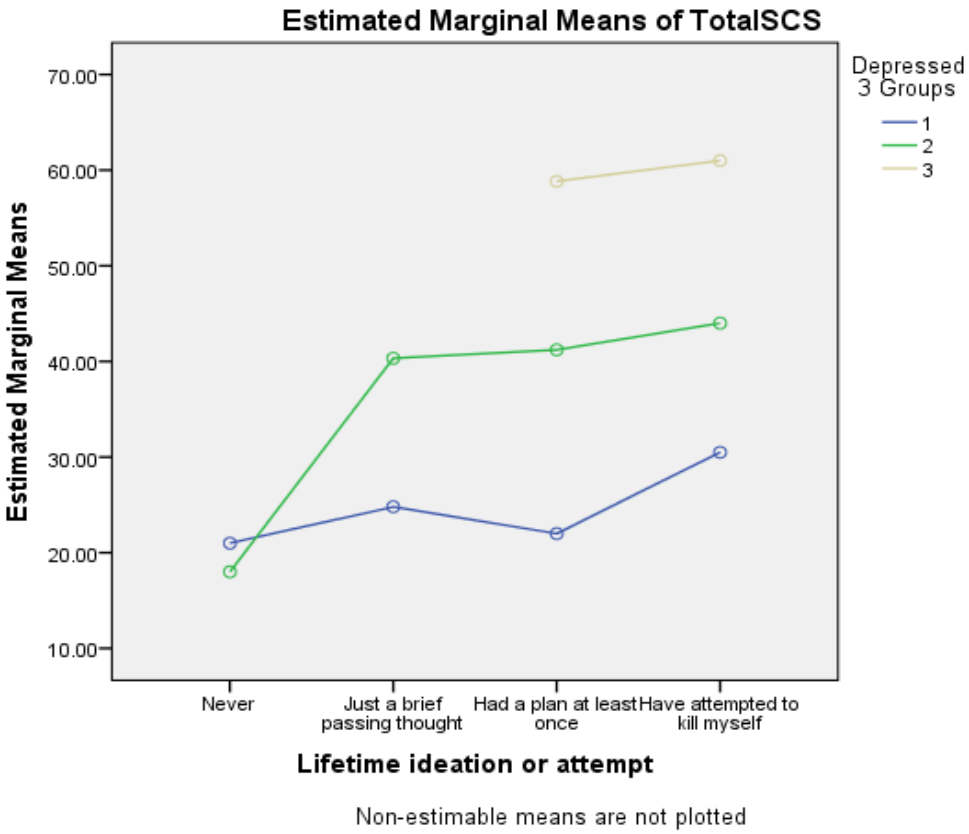
Dependent Variable: TotalSCS

	(I) Lifetime ideation or attempt	(J) Lifetime ideation or attempt	Mean Difference (I-J)	Std. Error	Sig.	99% Confidence Interval	
						Lower Bound	Upper Bound
Dunnett T3	Never	Just a brief passing thought	-5.91432	1.97162	.029	-12.6322	.8036
		Had a plan at least once	-23.36096*	3.21275	.000	-34.6604	-12.0615
		Have attempted to kill myself	-34.45966*	2.27272	.000	-42.0340	-26.8853
	Just a brief passing thought	Never	5.91432	1.97162	.029	-.8036	12.6322
		Had a plan at least once	-17.44664*	3.53706	.000	-29.5247	-5.3686
		Have attempted to kill myself	-28.54534*	2.71187	.000	-37.4963	-19.5944
	Had a plan at least once	Never	23.36096*	3.21275	.000	12.0615	34.6604
		Just a brief passing thought	17.44664*	3.53706	.000	5.3686	29.5247
		Have attempted to kill myself	-11.09870	3.71332	.028	-23.6140	1.4166
	Have attempted to kill myself	Never	34.45966*	2.27272	.000	26.8853	42.0340
		Just a brief passing thought	28.54534*	2.71187	.000	19.5944	37.4963
		Had a plan at least once	11.09870	3.71332	.028	-1.4166	23.6140

*. The mean difference is significant at the 0.01 level.

An independent between groups two-way ANOVA (see Appendix R) found that the interaction effect between SCS scores and depression was not significant. This suggests that levels of depression did not directly interfere with the pattern of suicide cognitions across the four suicidality groups. As seen in Figure 2.3 below, the SCS pattern seems to hold even in the absence of depression, which suggests that suicidal thoughts may be influenced by other factors, that suicidal thoughts can take place without being in a depressed state, and that cognition has some degree of independence from depression. It is of note, however, that as levels of depression increased, levels of suicide-cognitions within groups increased significantly.

Figure 2.3: SCS and Interaction with Depression



Key:
1 = No Depression
2 = Moderate Depression
3 = Severe Depression

As seen in Table 2.8 below, a one-way ANOVA confirmed that the observed mean differences in resilience between suicidality groups were significant $F_{(3, 110)} = 63.15$, $p < .001$.

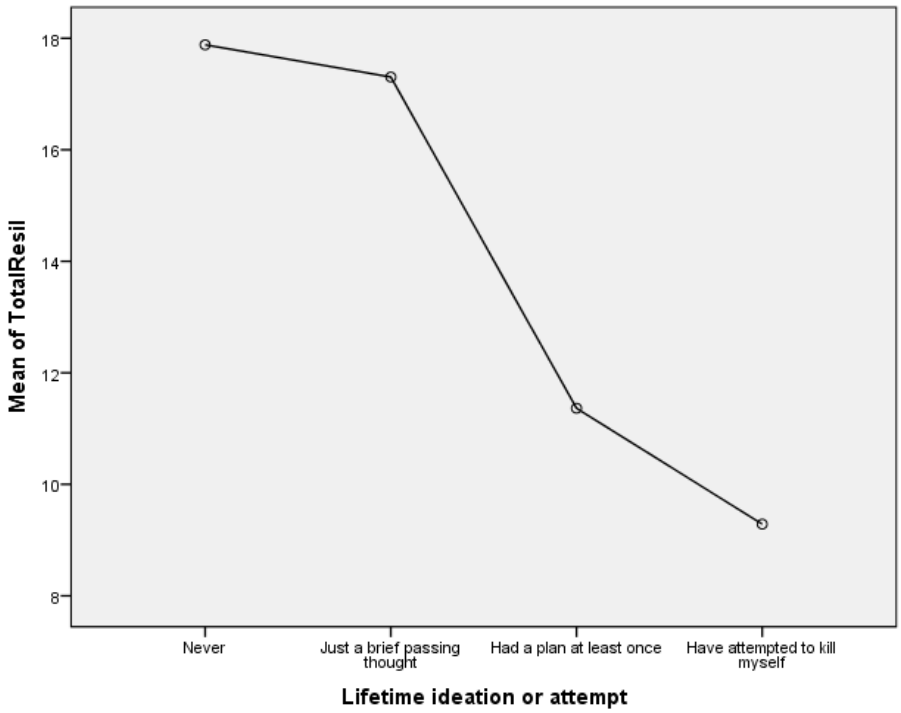
Table 2.8: ANOVA Results: Resilience

ANOVA
TotalResil

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	1692.394	3	564.131	63.151	.000
Within Groups	982.633	110	8.933		
Total	2675.026	113			

As illustrated in Figure 2.4 below, levels of resilience declined significantly across suicidality groups. Lower levels of resilience appear to have a dramatic impact on levels of suicidal cognitions. Being resilient does not seem to change the pattern of suicidal cognitions across groups, however, as levels of resilience decline there seems to be a rapid change in cognitive beliefs of hopelessness. See Appendix R for details.

Figure 2.4: Mean Resilience Score Across Suicidality Groups



A one-way ANOVA (see Table 2.9 below) confirmed that the observed mean differences in neurotic personality between suicidality groups were significant $F_{(3, 110)} = 91.30$, $p < .001$.

Table 2.9: ANOVA Results: Neurotic / Emotionally Stable Personality

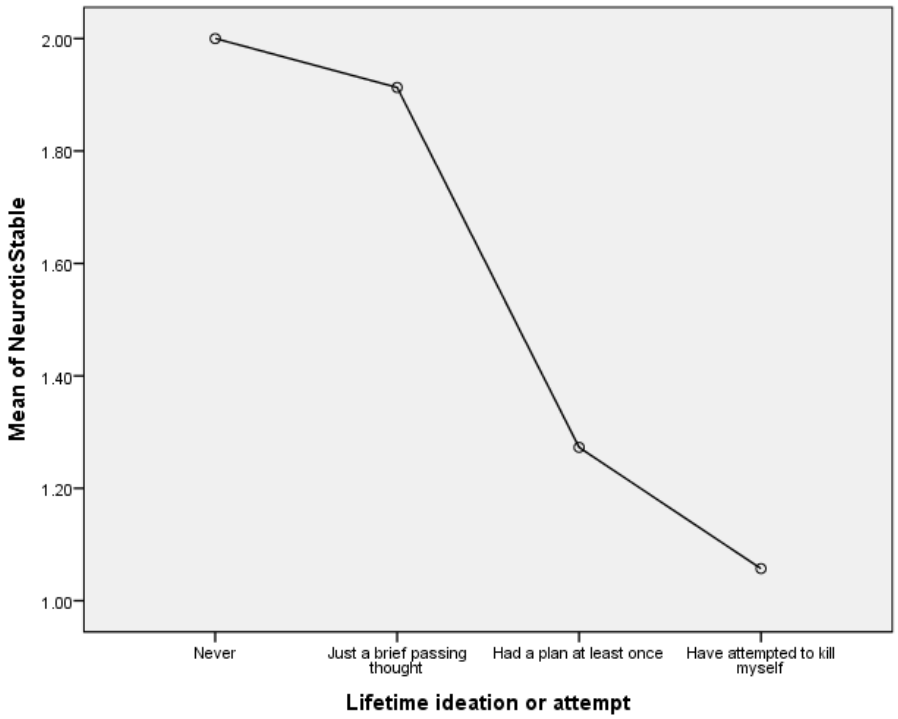
ANOVA
NeuroticStable

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	20.109	3	6.703	91.304	.000
Within Groups	8.075	110	.073		
Total	28.184	113			

As illustrated in Figure 2.5 below, the less emotionally stable (and so, the more neurotic) an individual, the more likely they are to plan or attempt suicide. There appeared to be no significant difference between 'Nevers' and 'Thinkers', or between 'Planners' and 'Attempters'; however, there was a significant

reduction in emotional stability between ‘Thinkers’ and ‘Planners’. See Appendix R for details.

Figure 2.5: Mean Neurotic / Emotionally Stable Score Across Suicidality Groups



2.4.4. Binary Logistic Regression

The third research question was: Can a risk prediction model of suicidality be formulated? To help answer this, Binary Logistic Regression was used. Two groups were created from the initial four suicidality groups: a ‘non-suicidal’ (‘Nevers’ and ‘Thinkers’) and a ‘suicidal’ (‘Planners’ and ‘Attempters’) group.

Based on findings (see Appendix R), neuroticism and extraversion personality traits, resilience, life satisfaction, demographic variables (age, gender, relationship status and educational degree) and total SCS score were entered

into a regression model. These key variables (other than SCS score and age) were converted from interval to categorical data. Depression was excluded due to issues of multicollinearity (see Appendix R for details).

Table 2.10 below provides information about the predictive model. It can be observed that three of the variables contribute significantly to the predictive ability of the model. Therefore, the major factors influencing whether an individual is suicidal are: suicidal cognitions reflecting a pervasive sense of hopelessness (Unbearable, Unsolvable, and Unlovable), having emotionally unstable or neurotic personality traits, and a low level of resilience. The negative scores (in column 'B') for neuroticism/emotional instability and resilience suggest that lower emotional stability and lower resilience increase the probability of inclusion in the 'suicidal' group.

Table 2.10: Predictive Model Variables

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)	95% C.I.for EXP(B)	
								Lower	Upper
Step 1[a]	TotalSCS	.096	.048	3.945	1	.047	1.101	1.001	1.211
	Extraversion(1)	.245	1.017	.058	1	.810	1.277	.174	9.381
	NeuroticStable(1)	-3.724	1.065	12.218	1	.000	.024	.003	.195
	SatLiveGroups2(1)	-.787	1.085	.525	1	.469	.455	.054	3.822
	Resil2Grps(1)	-2.149	.902	5.677	1	.017	.117	.020	.683
	AGE	-.029	.038	.591	1	.442	.971	.901	1.047
	GENDER(1)	-.374	.884	.179	1	.672	.688	.122	3.889
	EduDegree(1)	1.382	1.034	1.785	1	.181	3.982	.525	30.230
	RelateInOut(1)	-.023	1.026	.001	1	.982	.977	.131	7.296
	Constant	3.699	1.991	3.450	1	.063	40.396		

a. Variable(s) entered on step 1: NeuroticStable, Resil2Grps, SCSGroups2, SatLiveGroups2, Extraversion, AGE, GENDER, EduDegree, RelateInOut.

The remaining variables (in relative terms) are not as important within the model. The range of factors that do not seem to directly influence suicidality are: age; gender; education; relationship status; life satisfaction; and extravert personality traits.

The odds ratio (OR) indicate that the odds of an individual reporting suicidality are 1.101 times higher for every 1-unit increase in suicidal cognitions. The odds ratio for neuroticism/emotional instability and resilience have an inverse relationship, and so for every 1-unit increase (i.e. more emotionally stable and more resilient), there are fractionally lower odds of reporting suicidality. The actual OR is within the 95% confidence interval.

The predictive model was found to perform significantly better than a baseline model created by SPSS: χ^2 (9, *N*=114) = 116.62, p < .001. The predictive model explained between 64% and 85.4% of the variance in suicidality.

Table 2.11: Classification Table

Classification Table a.

			Predicted		
			Two Groups		
	Observed		1 Not suicidal	2 suicidal	Percentage Correct
Step 1	Two Groups	1 not suicidal	55	2	96.5
		2 suicidal	4	53	93.0
	Overall Percentage				94.7

a. The cut value is .500

Table 2.11 above gives an indication of how well the model is able to predict the correct category (not suicidal or suicidal). The model correctly predicts 94.7% of cases overall. In terms of the sensitivity of the model, it was able to identify 93% of participants who were suicidal. The specificity of the model relates to its ability to predict those in the group without the key characteristic of interest; in this case, those who are not suicidal. The model predicted 96.5% of cases in the not suicidal group.

2.5. Discussion

This study sought to examine whether the patterns of suicide cognitions differed in participants at different stages across the suicidality continuum (i.e. 'Nevers', 'Thinkers', 'Planners' and 'Attempters'). Further, whether suicide-specific cognitions, alongside other known factors associated with suicidality, contribute towards the formation of a distinct suicidal mode.

2.5.1. Suicidal Cognitions

The findings support the SCS factor pattern of Unbearable, Unsolvable and Unlovable. According to Rudd (2000), these cognitions are characterised by a pervasive hopelessness, and comprise the SBS, which is the entry point into the suicidal mode. Suicidal beliefs then trigger the other systems within the mode into operation, for instance involving intense, dysphoric affect, preparatory behaviours, and physiological arousal. The modal systems reciprocally influence each other, so that suicide-specific cognitive

hopelessness impacts mood and behavioural responses, and mood and behaviour impact cognition. The core belief categories found by the SCS are in line with those proposed by others (Rudd et al., 2001). The concept of poor distress tolerance (Unbearable) was posited as an important aspect of the pervasive hopelessness associated with suicidality; that is, an individual is more likely to become suicidal if they believe they are unable to cope with their pain, and that this will not change (Beck, 1995). Believing oneself to be helpless in the face of problems perceived as insurmountable, and the idea of death as the only solution to one's problems (Unsolvable), were suggested as central themes of suicidality-specific hopelessness (Beck, 1996). Believing oneself to be worthless or inadequate (Unlovable) has been associated with increased likelihood of suicidality (Bryan et al., 2014). Results seem to indicate Unbearable as the most dominant factor. It may be that this is triggered by the other two cognitive states. An intuitive pattern may be that social and personal problems are perceived as unsolvable, leading the individual to negative self-beliefs, which can result in beliefs about the 'unbearability' of life and a perceived inability to tolerate emotional pain and distress.

The findings also indicate that this cognitive pattern holds across different levels of suicidality and becomes increasingly intense as individuals move from the 'thinking' to the 'planning' stage. This suggests that this is where individuals enter the suicidal mode (Rudd, 2000). Prior to the 'planning' stage, the SBS appears to be lying dormant; as with other schemas. In response to an external or internal trigger, suicidal cognitions become activated and increase in intensity

(Rudd et al., 2001). Thus, risk increases as individuals move through the mode and along the continuum.

2.5.2. Suicidal Cognitions and Depression

The results show a strong degree of multicollinearity between suicidal cognitions and depression, indicating the difficulty in drawing out the interplay between cognitions and the depressive mood state. However, the pattern of suicidal cognitions holds across stages of suicidality, and at different depressive states (including in the absence of depression). This suggests that suicidal cognitions influence mood, so that the more one believes life to be unbearable, problems to be unsolvable, and themselves to be unlovable, the more depressed one becomes.

Findings demonstrated, however, that depression and suicidal cognitions are closely linked. Those at more severe stages of suicidality also demonstrated more severe depression, and depression dramatically impacted upon levels of hopelessness. This is in line with previous research, where the association between depression and suicidality has been well established (Rihmer, Rutz & Pihlgren, 1995). While suicidal cognitions may influence mood, consistent with the suicidal mode, these different systems are inter-related and reinforce each other. Thus, beliefs about the hopelessness of life can lead to depressed mood, and depressed mood can lead to even more hopelessness.

2.5.3. A Suicidal Mode: The Cognitive Risk Prediction Model

The risk prediction model confirmed the importance of suicidal cognitions. The basis of the model appeared to be suicide-specific cognitions, as measured by the SCS. As previously discussed, these cognitions can operate independently of depression, but they are also intricately linked. Suicidal cognitions and depressed mood seem to be associated with a dramatic decline in an individual's resilience when faced with adversity or stressful life-events. This is line with previous findings linking low resilience with a higher likelihood of suicidality (Nrugham, Hoten & Sund, 2010; Roy et al., 2007). The presence of neurotic, or emotionally unstable, personality traits also seems to increase vulnerability to suicidality; as found in previous studies (Ayub, 2015; Brezo et al., 2006).

The model does not appear to be influenced by key socio-demographic factors, such as age, gender, or other personality factors such as extraversion. This suggests that this model represents a cognitive baseline across populations, and that socially observed patterns in suicidality, e.g., amongst age groups, may not be due to age per se. Rather, they may be the result of social forces acting on a particular population group, which have a negative impact on their cognitive sense of hopelessness. For instance, the increased risk of suicidality amongst older adults may be linked with life-events at that point in the lifespan, such as bereavement, retirement, or physical illness, rather than age; increasing the sense of hopelessness (Conwell, Rotenberg & Caine, 1990).

2.5.4. Implications for Practice and Policy

This study may usefully inform primary prevention approaches for suicidality. In particular, incorporating measurement of suicidal cognitions, resilience and neurotic personality traits into routine screening and assessment of people presenting to General Practitioner (GP) surgeries with low mood will provide useful, relevant information. The scales allow GP's to look for markers of declining resilience and heightened suicidal cognitions over time. Those showing early signs of risk could benefit from self-help and psycho-educational information aiming to help them adjust hopeless cognitions and enhance resilience and emotional regulation. The findings are especially pertinent as they demonstrate that suicidal cognitions can occur independently of depression. This also has implications for cost-effectiveness, as it potentially reduces the need for anti-depressant medication. Effective assessment could help identify those for whom anti-depressants may be unlikely to work.

The findings also indicated the marked increase in suicidal cognitions between the 'thinking' and 'planning' stages, suggesting that this is where individuals enter the suicidal mode. As a means of early intervention, this would be an effective point. CBT based interventions targeting the identified suicide-specific cognitions, alongside skill-building in distress tolerance and emotional regulation (e.g. Linehan et al., 2006), are likely to be more effective before individuals shift to the more severe 'planning' stage of suicidality. The findings indicate that, at this point, suicidal cognitions, mood and resilience have changed dramatically, increasing risk. This study lends further support to the

assertions of Rudd and colleagues (2001), as they argued that timely intervention may work to halt progression through the suicidal mode.

This study highlights the need for directly addressing aspects unique to suicidality; most prominently, suicide-specific cognitions. It therefore follows that psychological formulation should explicitly consider the complexities suicidality can bring. The suicidal mode offers a useful framework for developing individual case conceptualisations for suicidal clients (see Figure 2.1; Rudd, 2000).

The current study found the SCS to be sensitive to different stages of suicidality. This suggests that as an individual shows positive progress throughout an intervention, or indeed, relapses, differences in their cognitive patterns may be tracked by clinicians using the SCS. This supports previous findings by Gibbs (2010), who reported the SCS to be effective in monitoring progress through treatment, and suggests that the SCS may be a useful tool in routinely measuring outcomes and treatment effectiveness with suicidal clients.

From a more systematic perspective, and again targeting suicidality prevention, consideration of resilience training or skill-building may be useful in school settings. Self-related cognitions, including perceptions of one's ability to manage adversity and cope with stress, are still developing in adolescence (Caspi & Roberts, 1999). Therefore, promotion of adaptive skills and cognitions at this stage of development may be an important step towards prevention of psychological difficulties later in life. School settings offer existing infrastructure

and resources that can be harnessed to design, deliver and evaluate group programmes designed to promote resilience and similar adaptive strengths in school-aged children. Resilience has been linked with other positive factors, including creativity, coping resources and social skills (Barbarin, Richter & de Wet, 2001; Simonton, 2000; Tusaie & Dyer, 2004); and so benefits could extend beyond protection against suicidality.

2.5.5. Limitations and Future Directions

A study limitation may be the fact that participants in the 'Never' and 'Thinkers' groups were largely (though not entirely) sampled from a University population. A random sampling method may have improved the generalisability of the results. Further, sampling participants comprising the 'Planners' and 'Attempters' from more than one NHS service may have improved generalisability. A larger sample would have also allowed for further refining of the results.

Only two items measured the 'neurotic' personality trait. Answers may have reflected a more anxious, overwhelmed emotional state at the time of participation; rather than necessarily capturing a stable trait. This may be expected if participants were experiencing psychological distress and/or suicidality. Utilising a more detailed measure may have allowed for more specific information on personality to be collected. However, the items, and the TIPI as a whole, have been reliably found to tap into personality traits (Gosling

et al., 2003), and measures were chosen in part for their brevity, so as to keep demands on participants as low as possible.

Measures were not presented to participants in a randomised order; if they had been, this may have guarded against fatigue effects. All measures were self-report, and therefore, may have been susceptible to response and social desirability biases (Leak & Parsons, 2001). However, self-report measures were the most appropriate, perhaps the only, method for gaining information about the private cognitions of individuals.

The SBQ-R, used to classify participants into four groups of suicidality, may not have captured the full range of suicidality. For example, those with experience of suicidal ideations may have experienced persistent thoughts about suicide, which were not 'brief and fleeting', yet did also not involve a suicide plan. Similarly, the SBQ-R did not distinguish between those who had made a single suicide attempt and those who had made multiple attempts. As previously identified, there may be important distinctions between these groups (Rudd et al., 1996). However, the SBQ-R was considered appropriate as it is a psychometrically tested measure which, despite its brevity, obtains a lot of relevant data. Building on this study, future researchers may wish to consider adapting the SBQ-R to capture 'Ideators' (those who have experienced suicidal ideation, but fit into neither the 'Thinkers' or 'Planners' group), and distinguishing between 'Single Attempters' and 'Multiple Attempters'. This would allow for examining suicidal cognitions across a fuller range of suicidality.

The cross-sectional design precluded any causal explanations of the results. For instance, it seems likely that suicidal cognitions exist as predisposing vulnerabilities to the development of suicidality. However, it may be possible that the experience of suicidality precedes development of associated cognitions. Longitudinal studies are needed to confirm the time order of the relationship. The present study can only determine the association between suicidal cognitions and suicidality, not that one preceded or caused the other. Therefore, future research could longitudinally examine the relationship between suicidal cognitions and suicidality, to provide further evidence of the role of suicide-specific cognitions.

Future research could usefully further explore the influence of mood on suicidal cognitions. For example, studies could cross-sectionally compare cognitive patterns, as measured by the SCS, in depressed and non-depressed participants. Alternatively, studies could follow a sample of depressed clinical participants longitudinally, administering the SCS and a measure of depression upon entry into the study and at agreed-upon time intervals. A longitudinal study could also measure suicide cognitions at baseline and after at least one further depressive episode. Studies may also wish to consider using a more detailed measure of depression, such as the Beck Depression Inventory, as this may provide more nuanced information about the nature of an individual's depression.

Building on the current findings, future research could also aim to enhance the predictive model by adding relevant variables. In particular, social support has

often been associated with suicidality; with high levels acting as protective, and low levels increasing risk (Chioqueta & Stiles, 2007). Importantly, while cognitions are intrapersonal, they can be influenced by interpersonal factors. For instance, difficulties within a relationship, or criticism at work, can influence negative cognitions and can act as a trigger to the suicidal mode. Acknowledging this social or interpersonal element will be important in future research. Evidence also suggests that traits of impulsivity are linked with suicidality (Mann et al., 1999). Impulsivity may be most relevant for more behavioural aspects of suicidality (e.g. attempts), but its inclusion in the model would help elucidate whether it can usefully predict risk. Addition of such factors may enhance the predictive ability of the model.

The model should also be confirmed as consistent across all socio-demographic groups. The current study included a sample relatively equally split in terms of gender and a large age range. However, more variation across different ethnicity or cultural groups, educational background or occupation, family background would be useful to examine the model's consistency across these differences. Additionally, confirming the model as consistent across groups with other mental health difficulties and diagnoses, including those previously identified as higher suicidality risk. These may include those with a diagnosis of bipolar, or personality disorders, or those with substance use difficulties.

2.6. Conclusions

The current study supports the existence of a Suicidal Belief System across different stages of suicidality, significantly increasing in intensity between 'thinking' and 'planning' stages. Cognitions comprising this belief system are characterised by a pervasive hopelessness, and defined by three themes of Unbearable, Unsolvable, and Unlovable. These suicide-specific cognitions, alongside low resilience and neurotic personality traits, significantly contribute to accurate prediction of suicidality risk. Findings can usefully inform primary prevention and early intervention for suicidal individuals. For instance, assessing suicidal cognitions, resilience and neurotic traits in those presenting with low mood to GP surgeries will allow primary care services to monitor markers of declining resilience or heightened cognitions. CBT informed interventions can usefully be targeted prior to 'planning' stages, as evidence indicates this is where individuals enter the suicidal mode and become at higher risk. An immediate research agenda could usefully extend the current findings by: more accurately testing the influence of mood on suicidal cognitions; enhancing the risk predictive model by adding relevant variables (e.g., social support or impulsivity); and confirming the model's consistency across various socio-demographic groups and other psychological factors.

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Chapter 3

Reflective Paper

Reflections on Research Through the Lens of the Cognitive Triad

Overall chapter word count: 3258

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Paper not intended for publication

3.1. Introduction

This final paper contains my reflections on the process and experience of conducting this research. Reflection, put simply, involves turning one's thoughts back (Dallos & Stedmon, 2009). It is a process involving consistent striving for awareness, understanding and acceptance, as well as ongoing education and skill-development (Alsop, 2000; Johns, 2012). Thus, it spans personal and professional development.

Given my focus on cognitive processes throughout this thesis, framing my reflections within Beck's (1976) Cognitive Triad felt appropriate and relevant. Using such a framework helped me to consider my experience of developing and conducting this research from different perspectives, and added further depth to my reflective practice.

Beck proposed his cognitive triad in relation to further elucidating the cognitive mechanisms involved in depression, and posited that a depressed individual holds core negative beliefs and assumptions about the self, the world, and the future (Beck, 1976; Beck, Rush, Shaw & Emery, 1979). This negative triad of cognitions mean that events and their meanings may be misinterpreted in order to remain consistent, resulting in a negative cognitive bias (Dwivedi & Varma, 1997). Whilst my own reflections were not linked with depression, or even necessarily beliefs negative in content, I felt that Beck's cognitive triad provided a useful framework within which to consider my reflections.

3.2. The Self

In Beck's (1976) cognitive triad, the 'self' component refers to cognitions and beliefs about oneself. Beck noted that in depression, self-beliefs are often negative and may typically include that one is inadequate or defective. However, for the purposes of this paper I have considered the 'self' component differently; as the facets of myself that have seemed most relevant throughout the research process. In particular, I have considered how researching suicide has impacted my 'self', and how I sometimes felt 'stuck between selves' during the research process.

3.2.1. Suicide and my 'Self'

Suicidal ideation and behaviour have always seemed a fundamental part of the role of the clinical psychologist. Even if we are lucky enough to never lose a client to suicide, we are always assessing and monitoring, formally or informally, for risk of suicidal behaviour. Many of the people we see struggle or have struggled with thoughts or actions related to ending their lives. Yet, there is much that remains uncertain about suicide. I have been faced with this uncertainty in my professional life, in trying to understand risk and vulnerability, alongside protective factors and the interaction between them. Personally, this has also been relevant. Like millions of others, I have lost a loved one to suicide. Also, like millions of other friends, relatives and loved ones, understanding 'why' has felt extremely difficult.

Thus, in reflecting upon aspects of my 'self' that seemed most relevant in the development of this research, I could not help but consider myself as someone bereaved by suicide. Thomas Joiner (2005) begins his book, "Why People Die by Suicide", with a poignant message reflecting on the loss of his father to suicide, and how this has profoundly impacted him; personally and professionally. Like Joiner, my own experience of losing someone important to me to suicide has shaped me in many ways, and has certainly influenced my interests and motivations with regards to doing research in this area. It seems intuitive that, given my desire to understand more about suicide, its impact, and especially the associated 'why's', I would be motivated to seek some answers through research.

Nonetheless, it felt a difficult balance to strike. My personal reasons and motivations fuelled significant interest and passion for the topic; yet I was aware, from the early days of developing this idea, that it would likely be important to maintain some degree of separation from my research. While I felt it essential to acknowledge that the seeds of the idea had grown from my own experience with suicide, I also wanted to keep a certain amount of distance from the study so as to avoid becoming embroiled in powerful emotions linked with loss. Even without personal experiences, suicide is an emotive topic. I wanted to ensure a level of self-care throughout this process, and upon reflection this may have been part of my drive to utilise quantitative methods. Although at times in my clinical practice I work with clients with experiences of suicidal ideation and behaviour, I wondered whether in-depth exploration of

participants' experiences of suicidality through qualitative methodology might feel different.

Quantitative methods felt like they allowed a degree of healthy separation. They allowed me to keep the topic close, and use my connectivity to the subject to further my understanding; yet not too close, which felt safer and more manageable. I also wonder whether, given my struggle over the years to explain or understand why suicide seemed the only option, I may have been motivated by a search for 'the truth', or perhaps more concrete answers. If this was the case, perhaps this is why I felt more drawn to a positivist epistemological position, which may aim to offer this. However, this was not the determining factor for my choice of methodology. A quantitative methodology presented as the most logical way to develop the research, given its aim to understand more about suicidal cognitions.

Throughout the process I have shifted towards a 'critical realist' position, acknowledging that any objective reality is influenced by individual perception and interpretation. In a field as complex and individualistic as suicidality, this is especially important. Although concrete truth may prove elusive, my research can nonetheless build on understanding of suicidality – and this is a valuable contribution.

3.2.2. Stuck Between Selves

As part of my 'self' was someone bereaved by suicide, I often found myself feeling stuck between different selves, or different positions, throughout the research process. I often reflected on Berger's (2015) concepts of 'insider' and 'outsider' positions within research. Though Berger was discussing qualitative research, these still felt relevant. The insider position refers to a researcher with prior connection or familiarity with a subject, whereas the outsider position involves a researcher without this experience. Whilst my own position, or self, could be considered an 'insider' due to my personal experience of being bereaved by suicide, it also may be considered an 'outsider' position, in the sense that I myself have no personal experience of suicidal ideation or behaviour. I therefore felt as though I did not quite belong to either position; and, in a sense, as if I was stuck between these two potential selves.

Further, perhaps like many clinicians involved in research, the tensions between the two roles, or selves, of clinician and researcher at times felt challenging. As my research self, it was not appropriate or feasible for me to offer a clinical intervention; within this role, my responsibility was to inform the clinical team working with the participant, who would then offer support and manage any risk. Initially, this left me feeling frustrated and guilty. As my clinical self, I felt more familiar with offering support and an intervention informed by a framework or model. As this was not my role in this situation, I was left feeling ineffectual and powerless to help participants reporting their struggle with suicidality; indeed, perhaps echoing similar feelings to the participants. My sense of

powerlessness may have, in part, originated from the fact that research participants held information I needed for my study, which they could limit or withhold if they wished. This was unlike a therapeutic situation, where my clinical role may have afforded a more dominant role in power relations.

In reflecting on my feelings, I found Joiner's (2005) notion of 'perceived burdensomeness' helpful. He defined it as a (usually mistaken) perception that one is a burden on others. I worried at times that I was being a burden to participants by asking them to be involved in the research and complete the questionnaires; this worry was often accompanied by feelings of guilt. However, considering this idea helped me to recognise that my research had the potential to add to the suicidal literature, perhaps one-day informing treatment. It also helped me remember that my participants were adults with capacity to decline to take part, should they wish. This was a helpful reminder to respect participants' agency in making their own decisions, and a useful lesson to continue to take forward.

I also found Joiner's (2005) idea of 'thwarted belonging' relevant in reflecting on feeling stuck between selves. In adopting a researcher role, I initially felt I had somehow stepped back from my more familiar clinical role. I felt somewhat displaced, and in a sense, belonging to neither my clinical self or my researcher self. This left me wondering: where did I belong? Struggling to feel I 'belonged' to the profession of clinical psychology has been a familiar theme for me throughout training. Therefore, it was perhaps unsurprising that as my role changed, I was left feeling a bit lost and adrift. However, again, reflecting on

Joiner's idea helped me recognise that the clinical and researcher selves can be integrated. They need not be separate, and they need not be at-odds with one another. Instead, more helpfully, they can be considered from a 'both/and' perspective (Burnham, 1992). That is, I do not have to be *either* a clinician *or* a researcher; I can, and want to be, *both* a clinician *and* a researcher. Reflection also helped me appreciate which skill-sets are most appropriate depending on which role I am engaging in.

3.3. The World

For Beck (1976), the 'world' component of the cognitive triad refers to cognitions about an individual's world or environmental context. Beck posited that depressive cognitions about one's world may typically involve beliefs and assumptions that the world is unpredictable and unfair. At times, the research world seemed similarly unpredictable, inspiring worries about obtaining enough participants, meaningful results, ethical approval, etc. However, for the purposes of this paper, I have instead considered the 'world' component as the NHS context in which my research was conducted and beliefs about risk in this world.

3.3.1. Hopelessness in the NHS World

Whilst working on my thesis, I was working in acute day services. I began to notice a sense of hopelessness amongst staff around the ability, or lack thereof, to effectively predict and treat suicidal behaviour. That is not to say that staff

did not know how to assess for risk, how to manage suicidal behaviour, and how to work towards prevention. Staff appeared well-trained in 'what to do'. However, they also appeared sceptical about whether their actions were reliably effective in practice. During my time in the service, a client (not a research participant) took his own life. This understandably impacted staff, and they spoke of feeling powerless and hopeless. One staff member summed up the sense in the team: "maybe there's no way of really knowing". If NHS staff truly feel that there is no way to reliably identify those at risk, they may come to believe that is futile to try; in turn leaving them feeling hopeless about their abilities to help keep their clients safe.

I noticed corresponding feelings of hopelessness in myself as well. Through my thesis as well as my work in acute services, I was beginning to see suicidality everywhere. In my therapy clients, research participants, other acute service-users, my thesis reading and writing. It came to be, in some sense, in my thoughts most days; particularly as the thesis took up increasing proportions of time as the deadline drew nearer. At times, this felt overwhelming, and I felt hopeless about my ability to make sense of a complex subject and offer recommendations for reducing suicidality. Supervision helped me to talk through my concerns and hear them normalised. This helped me manage my feelings and reminded me that they may reflect some counter-transference, defined as feelings that can arise in the therapist in response to the client (Hughes, 1999), as many suicidal individuals report similar feelings of hopelessness, powerlessness and futility.

On reflection, I wonder whether my choice of topic for my systematic literature review was an attempt to manage hopelessness in the NHS world. Choosing to focus on the association between suicidal ideation and a protective factor, optimism, seems likely to indicate my need to incorporate more positivity into my thesis. Intuitively, and illustrated in my review, optimism affords some protection against suicidal ideation, and can contribute to better outcomes. I also think it would have been helpful to share my reflections with the staff team. Making more time for reflective practice within teams is important, and discussing our potential experiences of counter-transference may have helped to separate our own feelings from those of the clients, and to normalise our feelings whilst offering mutual support.

3.3.2. The World is Risky

I wondered whether researching and working in acute services simultaneously left me desensitised to risk at times. That is, through consistent contact with individuals considered risky in terms of suicidality, such a level of risk began to seem almost 'normal'. It has been noted that those frequently exposed to suicidality can eventually mis-perceive it as more common than it actually is (Menninger, 1936). I felt wary of becoming immune or de-sensitised to reported suicidality. I did not want to unconsciously under-estimate the impact of intensely distressing thoughts, feelings or experiences simply because I was becoming habituated to their discussion. Supervision was essential in managing these concerns; it allowed me to reflect on times when I may have felt less tuned-in to risk or times when I lost sight of the rarity of suicidality.

Reflecting again on Joiner's (2005) necessary components of suicidal behaviour, his concept of 'acquired capability' seemed relevant in a sense. Joiner discusses acquired capability in terms of an individual becoming acclimatised to mental and/or physical pain, in a sense 'working up to' increasingly lethal suicide behaviour. However, I instead considered it more in line with becoming more practiced in discussing suicidality with those experiencing it.

Undertaking such research alongside an acute placement meant that I had ample opportunities to enhance my awareness of suicidality, and to increase my comfort and skill in asking and talking about it. I found that demonstrating willingness to engage in discussion of suicidality seemed to help clients feel more at ease, perhaps because they rarely felt able to discuss suicidal thoughts and behaviours with others in their lives. It felt quite a powerful intervention to allow people, should they wish, to discuss their experiences with suicidality; as they may have previously felt that such discussion was restricted, or taboo. Allowing, even promoting, such discussion seemed to transmit the message that suicidality was 'OK to talk about', and also facilitated a more thorough and individualised risk assessment. Thus, reflection helped me recognise some positive components to a perceived 'immersion' in risk, and that suicidality is only one role that people can adopt within their world.

3.4. The Future

Beck's (1976) 'future' component of the cognitive triad refers to cognitions and expectations about an individual's future. For Beck, depressive cognitions about the future may typically include expectations of failure and unremitting hardship (Beck et al., 1979). However, for this paper, I have instead considered the 'future' component as fears about not 'measuring up' and life beyond training.

3.4.1. Fears About Not Measuring Up

When considering the future in relation to this research process, my first thought was a fear that I will not 'measure up'; that is, that I will fail to meet the standards and expectations of the course. In a clinical training context, the thesis is arguably the most demanding standard of all, and I worry that I will fall short. Although this is likely a common concern amongst trainees in similar situations, it felt important to address, rather than dismiss. Looking back, I felt sceptical of my research abilities prior to training; in hindsight this was reflective of more general difficulties with self-confidence. I have also been aware of my inclinations towards striving to meet high-self standards. Taken together, I felt that my long-standing apprehension of research and my striving tendencies may, if un-addressed, lead me to experience even more stress than might otherwise be expected. Therefore, I felt it important to utilise tools I have previously found helpful at stressful times. Self-compassionate exercises helped me adopt a more balanced view, whereby my fear of not measuring up

was neither a foregone conclusion, nor a total catastrophe. Mindfulness exercises helped me accept rather than fight difficult feelings of fear and inadequacy. I found that the reflective skills cultivated throughout training equipped me to recognise my personal early warning signs of stress, and to know how to manage them. As a result, I felt better able to manage the challenges associated with my fears about not measuring up.

My chosen literature review topic may again be relevant here. It may be that exploring optimism, defined as a general expectation of a favourable future and of meeting one's goals in life (Scheier & Carver, 1985), was a way of cultivating a more positive, optimistic view of the future, at a time when I was feeling uncertain. In hindsight, it seems that my focus on optimism helped me be mindful of the future even when the present seemed all-consuming and never-ending; at times, remembering that there would come a thesis-free future, became the light at the end of the tunnel.

3.4.2. Beyond Training

Remaining mindful of the light at the end of the tunnel, whilst reassuring, also sometimes provoked anxiety. A thesis-free future is also usually associated with a future after training; a future as a qualified clinical psychologist. Regardless of whether there may be frustrations or restrictions inherent to the trainee role, it feels relatively safe and protected. As qualified staff; caseload, responsibilities and expectations increase, which for me has brought its own worries and anxieties – as above, linked with not measuring up. However,

these thoughts about a future beyond training are also associated with feelings of pride, excitement, achievement and optimism. Working towards this qualification has been a long, emotional and overall enjoyable journey that has impacted me personally and professionally.

Reflecting on the development of my research idea, I chose a topic and design that may offer scope for several post-thesis publications. The data collected offer options for continuing to contribute to research after training. I wonder whether this may, at least in part, be reflective of my striving tendencies. Planning ahead and ensuring at least the option of further publications may offer a means of protecting – or distracting – against concerns about not being good enough or about failing. Further, maintaining some link with my 'trainee-life' may offer familiarity and comfort when faced with relative uncertainty in the qualified role. Nonetheless, I felt motivated to engage in research that may inform my next career steps. I did not want to view the research as simply a 'necessary course requirement', and I remain hopeful that my study can contribute to the literature.

3.5. Conclusions

Beck's (1976) cognitive triad provided a useful framework within which I could explore my cognitions in relation to myself, the world and the future; those activated through my research journey. Awareness and self-care seemed particularly important as the topic linked with my personal experience. The 'reflective-practitioner' (Schon, 1983) position, as well as personal therapy,

helped me lay a foundation from which to approach the challenges associated with research; particularly research with a strict time-scale and high expectations. Reflection can nurture development and sustain learning (Dallos & Stedmon, 2009), and this was evidenced for me throughout my research journey. I hope to take these lessons and this understanding with me into my future career.

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Appendices

Appendix A: Author Guidelines for 'Suicide and Life-Threatening Behavior'

Suicide and Life-Threatening Behavior

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Author Guidelines

Submissions. As of December 1, 2010 all manuscript submissions to Suicide and Life-Threatening Behavior can be made online via Manuscript Central, the web-based submission, tracking and peer review system.
Suicide and Life-Threatening Behavior is devoted to emergent theoretical, scientific, clinical, and public health approaches related to violent, self-destructive, and life-threatening behaviors. It is multidisciplinary and concerned with a broad range of related topics including, but not limited to, suicide, suicide prevention, death, accidents, biology of suicide, epidemiology, crisis intervention, postvention with survivors, nomenclature, standards of care, clinical training and interventions, violence.
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Cover Letter. With your submission include a cover letter designating one author as correspondent for the review process, and provide a complete address, including phone and fax. In this letter please attest that neither the manuscript nor any other substantially similar paper has been published, except as described in the letter. The corresponding author should also attest that in the case of several authors, each one has studied the manuscript in the form submitted, agreed to be cited as a coauthor, and has accepted the order of authorship. If author affiliations are given with regard to academic, hospital, or institutional affiliations, it is the author[s] responsibility to obtain any required permissions from the proper authorities to utilize such affiliations.

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Abstracts. The abstract should be displayed on a separate page and consist of not more than 100 words. It should present the reason for the study, the main findings, and the principal conclusions.

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Appendix B: Quality Assessment Framework

Quality indicator	Abdel-Khalek & Lester, 2002	Amer & Hamdan-Mansour, 2014	Ballard et al., 2015	Bryan et al., 2013	Chin & Holden, 2013	Davidson & Wingate, 2013	Feng et al., 2015	Hirsch & Conner, 2006	Hirsch et al., 2006	Hirsch, Conner & Duberstein, 2007	Hirsch, Duberstein, et al., 2007	Hirsch, Wolford, et al., 2007	Hirsch et al., 2009	Moody & Smith, 2013	O'Connor et al., 2008	O'Dwyer et al., 2016	O'Keefe & Wingate, 2013	Rasmussen & Wingate, 2011	Rosengard & Folkman, 1997	Sanchez-Teruel et al., 2013	Tucker et al., 2013
Does the title reflect the content?	1	2	2	2	2	2	2	2	2	2	2	2	2	1	2	2	2	2	2	2	2
Are the authors credible?	2	1	2	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	2
Does the abstract summarise the key components?	1	2	2	2	1	2	2	2	2	2	1	2	2	2	2	2	2	1	2	2	2
Is the rationale for undertaking the research clearly outlined?	2	2	2	2	2	2	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Is the literature review comprehensive and up-to-date?	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Is the aim of the research clearly stated?	1	2	2	2	1	2	2	2	2	2	2	1	2	2	2	1	2	2	2	2	2
Are all ethical issues identified and addressed?	0	2	2	1	0	0	2	1	0	1	2	1	0	2	2	2	1	0	0	0	1
Is the methodology identified and justified?	1	2	2	1	1	1	2	1	1	1	1	1	1	1	1	2	1	1	2	1	1
Is the study design clearly identified, and is the rationale for choice of design evident?	1	1	2	2	1	1	2	1	1	1	1	1	1	2	2	2	1	2	2	1	1
Is there an experimental hypothesis clearly stated? Are the key variables clearly defined?	0	2	2	1	1	2	1	2	2	2	2	2	2	2	2	1	2	2	0	1	2
Is the population identified?	1	2	2	2	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Is the sample adequately described and reflective of the population?	1	2	1	2	1	1	1	1	1	1	1	1	1	1	2	2	2	2	1	1	2
Is the method of data collection valid and reliable?	2	2	2	2	2	2	2	2	1	2	2	2	2	2	2	2	2	2	2	2	2
Is the method of data analysis valid and reliable?	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Are the results presented in a way that is appropriate and clear?	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Is the discussion comprehensive?	1	1	2	2	2	2	1	1	1	1	2	2	1	2	2	2	2	2	1	2	2
Are the results generalisable?	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	1	1	1	1	1
Is the conclusion comprehensive?	1	1	2	2	2	2	1	1	1	1	2	2	1	2	2	2	2	2	2	2	2
TOTAL	**20**	**30**	**34**	**31**	**26**	**30**	**30**	**29**	**27**	**29**	**31**	**30**	**28**	**32**	**35**	**34**	**32**	**31**	**29**	**28**	**32**

Appendix C: Psychometric Information for Measures

Suicide Behaviours Questionnaire-Revised (SBQ-R)

The Suicide Behaviours Questionnaire-Revised (SBQ-R; Osman et al., 2001) was used to screen for risk of suicidality. The SBQ-R is a 4-item measure asking participants to report their experience of suicidal ideation, planning and attempts. Despite the brief administration, a broad range of information is obtained from this measure, making it useful in clinical practice (Osman et al., 2001).

The SBQ-R has been found to be a reliable measure, with Cronbach alpha coefficients ranging from 0.76 to 0.88 demonstrating moderate to high internal consistency across use in clinical and non-clinical, and adult and adolescent, samples (Gibbs, 2010; Osman et al., 2001). Good validity has also been demonstrated, as the SBQ-R has been found to effectively distinguish between suicidal and non-suicidal adults and adolescents (Gibbs, 2010; Osman et al., 2001). Osman et al. (2001) have advocated that a cut-off score may be most effective for use in clinical samples, whereas a cut-off of 7 may be more appropriate in non-clinical samples.

Suicide Cognitions Scale (SCS)

The Suicide Cognitions Scale (SCS; Rudd, 2007) was used to measure suicidal cognitions. The SCS is an 18-item self-report measure that assesses suicide-specific cognitions. These are characterised by hopelessness, and typically reflect core beliefs that life is 'unbearable' (e.g. "When I get this upset, it is unbearable"), problems are 'unsolvable' (e.g. "No one can help solve my problems"), and the individual is 'unlovable' (e.g. "I am completely unworthy of love"). Participants rated their level of agreement with each statement using a 4-point Likert scale. Responses ranged from 'Strongly Disagree' (1) to 'Strongly Agree' (4). As previously noted, the SCS was adapted by removing the 'Neutral' mid-point option along the original 5-point Likert scale. Total scores ranged from 18 to 72, with higher scores indicating greater suicide-specific hopelessness.

Studies have found the SCS to be a reliable measure, reporting Cronbach alpha coefficients ranging from 0.93 to 0.97 across clinical and student samples of adults and adolescents, indicating excellent consistency (Gibbs, 2010; Slee, Spinhoven, Garnefski & Arensman, 2008). Further, Rudd et al. (2010; cited in Gibbs, 2010) compared SCS scores of psychiatric inpatients at admission and discharge, and college students over a five-day period, as a means of examining test-retest reliability. For the inpatients, they reported a coefficient of 0.54; and for the students 0.84, indicating that SCS scores appear more stable in participants not experiencing significant clinical symptoms or involved in treatment targeting their suicide-specific cognitions. This suggests that the SCS can be useful in monitoring progress in treatment, throughout an intervention.

The SCS was highly correlated with other measures of suicidality, depression and hopelessness, demonstrating convergent validity. The SCS was less correlated with anxiety measures, demonstrating discriminant validity (Gibbs, 2010). The SCS has been found to effectively predict suicidal ideation in

clinical and student samples. It was also best able to distinguish between those with a history of suicide attempts and those with no such history, between those with ideations and those who had made attempts, and between those who made a single attempt and multiple attempts, when compared with other measures of suicidal ideations (Hovey et al., 2005; Rudd et al., 2010; cited in Gibbs, 2010). Thus, the SCS has demonstrated good validity as a measure of suicide-specific cognitions.

Brief Resilience Scale (BRS)

The Brief Resilience Scale (BRS; Smith et al., 2008) was used to measure resilience. The BRS is a six-item, self-report measure of resilience, defined as the ability to bounce back, cope and function well despite adversity or stress (Rutter, 1993). Half of the items are positively worded, and half are negatively worded. The BRS is scored by reverse-coding the negatively worded items and finding the total mean. Participants rated their level of agreement with each statement using a 4-point Likert scale. Responses ranged from 'Strongly Disagree' (1) to 'Strongly Agree' (4). As previously noted, the BRS was adapted by removing the 'Neutral' mid-point option along the original 5-point Likert scale. Total scores ranged from 6 to 24, with higher scores indicating greater resilience.

The BRS was found to be a reliable measure across student samples, a sample of cardiac rehabilitation patients and a sample of chronic pain patients (Smith et al., 2008). It was found to have high internal consistency, with Cronbach alpha coefficients ranging from 0.80 to 0.91 (Smith et al., 2008). Smith et al. (2008) also demonstrated the validity of the BRS, finding it to be significantly related to individual resilience resources and health outcomes as expected. It was also able to distinguish between cardiac patients with and without Type D personality (related to poor cardiac prognosis) and women with and without fibromyalgia (Smith et al., 2008).

Ten-Item Personality Inventory (TIPI)

The Ten-Item Personality Inventory (TIPI; Gosling et al., 2003) was used to measure personality traits. The TIPI is a ten-item, self-report measure of the Big-Five Personality Dimensions (Extraversion, Agreeableness, Conscientiousness, Emotional Stability/Neuroticism, and Openness to Experience). Participants rated their level of agreement with each statement using a 4-point Likert scale. Responses ranged from 'Strongly Disagree' (1) to 'Strongly Agree' (4). As previously noted, the TIPI was adapted by removing the 'Neutral' mid-point option along the original 7-point Likert scale. Half of the items are reverse-coded, with one standard item and one reverse-coded item making up each of the five subscales. The score for each subscale is the average of the two relevant items.

The TIPI has demonstrated adequate levels of convergent validity with widely used Big-Five measures in self, observer, and peer reports, as well as convergence between self-ratings and observer-ratings. Test-retest correlations were 0.72, demonstrating good reliability. This is considered the most appropriate reliability estimate for such a brief measure, whereby only a few items are measuring broad domains (Gosling et al., 2003).

Patient Health Questionnaire-9 (PHQ-9)
The Patient Health Questionnaire-9 (PHQ-9; Spitzer, Kroenke, Williams & Patient Health Questionnaire Primary Care Study Group, 1999) was used to measure depression. The PHQ-9 is a self-report, 9-item measure of depressive symptoms and their impact on an individual. Total scores range from 0 to 27. Cut-off scores indicating mild (5), moderate (10), moderately severe (15), and severe (20) depression. The PHQ-9 is recommended by the Improving Access to Psychological Therapies (IAPT) service in the UK's NHS for screening for depressive symptoms.

The PHQ-9 was found to be a reliable measure across different types of clinical samples (primary care patients and obstetrics-gynecology patients), with Cronbach alpha coefficients ranging from 0.86 to 0.89. Test-retest reliability was represented by a strong correlation of 0.84 (Kroenke, Spitzer & Williams, 2001). The PHQ-9 established good sensitivity and specificity of the measure was established through a re-interview of a sample of patients by a mental health professional. The PHQ-9 was strongly associated with scores on related measures (e.g. functional status and symptom-related difficulty), and findings from the primary care sample were replicated with the obstetrics-gynecology sample. Thus, the PHQ-9 appears to be a valid measure, and generalisable to other clinical settings (Kroenke et al., 2001).

World Health Organization Quality of Life assessment-BREF (WHOQOL-BREF)
Ten items from the self-report WHOQOL-BREF (WHOQOL Group, 1998) were used to measure satisfaction with life. Broadly, the items cover life satisfaction across physical and psychological health, social relationships and environment domains. Participants rated their level of agreement with each statement using a 4-point Likert scale. Total scores ranged from 10 to 40, with higher scores denoting more satisfaction with life.

The WHOQOL-BREF measure was found to be a reliable measure, with Cronbach alpha coefficients ranging from 0.68 to 0.82 across domains (Skevington, Lotfy & O'Connell, 2004), and 0.91 for the whole scale (Yao, Chung, Yu & Wang, 2002). It has also demonstrated good discriminant, construct and cross-cultural validity (Skevington et al., 2004; Yao et al., 2002).

Appendix D: Demographic Information Sheet

INSTRUCTIONS:
Please answer each of the questions below

01 How old are you? _____ years

02 Are you: Male ☐ Female ☐

03 Please tick any of the qualifications you have from the list below:

- GCSE's ☐
- A levels ☐
- Diploma/Certificate ☐
- Under-graduate degree or higher ☐
- None of the above ☐
- Other qualifications *(please specify below)* ☐

_____

04 What is your marital status?

- Single (by choice) ☐
- Single (NOT by choice) ☐
- Married ☐
- Living with Partner ☐
- Separated ☐
- Divorced ☐
- Widowed ☐

05 Have you ever been diagnosed with any of the following?

	Yes	No
Depression or Bipolar Disorder	☐	☐
Personality Disorder	☐	☐
Schizophrenia	☐	☐
Psychosis	☐	☐
Have you ever had difficulties with alcohol?	☐	☐
Have you ever had difficulties with drugs?	☐	☐

Appendix E: Suicide Behaviours Questionnaire-Revised (SBQ-R; Osman et al., 2001)

INSTRUCTIONS:
Please check the number beside the statement that best applies to you.

1. Have you ever thought about or attempted to kill yourself? (check one only)

Never	☐
It was just a brief passing thought	☐
I have had a plan at least once to kill myself but did not try to do it	☐
I have had a plan at least once to kill myself and really wanted to die	☐
I have attempted to kill myself, but did not want to die	☐
I have attempted to kill myself, and really hoped to die	☐

2. How often have you thought about killing yourself in the past year? (check one only)

Never	☐
Rarely (1 time)	☐
Sometimes (2 times)	☐
Often (3-4 times)	☐
Very often (5 or more times)	☐

3. Have you ever told someone that you were going to commit suicide, or that you might do it? (check one only)

No	☐
Yes, at one time, but did not really want to die	☐
Yes, at one time, and really wanted to die	☐
Yes, more than once, but did not really want to do it	☐
Yes, more than once, and really wanted to do it	☐

4. How likely is it that you will attempt suicide someday? (check one only)

Never	☐
No chance at all	☐
Rather unlikely	☐
Unlikely	☐
Likely	☐
Rather likely	☐
Very likely	☐

Appendix F: Suicide Cognitions Scale (SCS; Rudd, 2007)

INSTRUCTIONS:
Please read each of the statements below and then tick a box to show how strongly you agree or disagree with each of the statements

		Strongly Disagree	Disagree	Agree	Strongly Agree
01	The world would be better off without me				
02	Suicide is the only way to solve my problems				
03	I can't stand this pain anymore				
04	I've never been successful at anything				
05	I can't tolerate being this upset any longer				
06	I can never be forgiven for the mistakes I've made				
07	No one can help me solve my problems				
08	It is unbearable when I get this upset				
09	I am completely unworthy of love				
10	Nothing can help solve my problems				
11	It is impossible to describe how badly I feel				
12	I can't cope with my problems any longer				

		Strongly Disagree	Disagree	Agree	Strongly Agree
13	I can't imagine anyone being able to withstand this kind of pain				
14	There is nothing redeeming about me				
15	Suicide is the only way to end this pain				
16	I don't deserve to live another moment				
17	I would rather die now than feel this unbearable pain				
18	No one is as loathsome as me				

Appendix G: Brief Resilience Scale (BRS; Smith et al., 2008)

INSTRUCTIONS:
Please read each of the statements below and then tick a box to show how strongly you agree or disagree with each of the statements

		Strongly Disagree	Disagree	Agree	Strongly Agree
01	I tend to bounce back quickly after hard times				
02	I have a hard time making it through stressful events				
03	It does not take me long to recover from a stressful event				
04	It is hard for me to snap back when something bad happens				
05	I usually come through difficult times with little trouble				
06	I tend to take a long time to get over set-backs in my life				

Appendix H: Ten-Item Personality Inventory (TIPI; Gosling et al., 2003)

INSTRUCTIONS:
Please read each of the statements below and then tick a box to show how strongly you agree or disagree with each of the statements

		Strongly Disagree	Disagree	Agree	Strongly Agree
01	I see myself as extraverted and enthusiastic				
02	I see myself as critical and quarrelsome				
03	I see myself as dependable and self-disciplined				
04	I see myself as anxious and easily upset				
05	I see myself as open to new experiences and complex				
06	I see myself as reserved and quiet				
07	I see myself as sympathetic and warm				
08	I see myself as disorganised and careless				
09	I see myself as calm and emotionally stable				
10	I see myself as conventional and uncreative				

Appendix I: Patient Health Questionnaire-9 (PHQ-9; Spitzer et al., 1999)

INSTRUCTIONS:
Please read each of the statements below and then tick a box to show how often you have been bothered by any of the following problems **over the last 2 weeks**

		Not At All	Several Days	More Than Half The Days	Nearly Every Day
01	Little interest or pleasure in doing things	☐	☐	☐	☐
02	Feeling down, depressed, or hopeless	☐	☐	☐	☐
03	Trouble falling/staying asleep, sleeping too much	☐	☐	☐	☐
04	Feeling tired or having little energy	☐	☐	☐	☐
05	Poor appetite or overeating	☐	☐	☐	☐
06	Feeling bad about yourself – or that you are a failure or have let yourself or your family down	☐	☐	☐	☐
07	Trouble concentrating on things, such as reading the newspaper or watching television	☐	☐	☐	☐
08	Moving or speaking so slowly that other people could have noticed. Or the opposite – being so fidgety or restless that you have been moving around a lot more than usual	☐	☐	☐	☐
09	Thoughts that you would be better off dead or of hurting yourself in some way	☐	☐	☐	☐

If you have been bothered by **any** of the 9 problems listed above, please answer the following by ticking one box:

		Not Difficult At All	Somewhat Difficult	Very Difficult	Extremely Difficult
10	How difficult have these problems made it for you to do your work, take care of things at home, or get along with other people?	☐	☐	☐	☐

Appendix J: World Health Organization Quality of Life assessment-BREF (10 items from the WHOQOL-BREF; WHOQOL Group, 1998)

INSTRUCTIONS:
Please read each of the statements below and then tick a box to show how strongly you agree or disagree with each of the statements

		Strongly Disagree	Disagree	Agree	Strongly Agree
01	I am satisfied with my general appearance.				
02	I am satisfied with my personal relationships.				
03	I am satisfied with the support I get from friends.				
04	I am satisfied with my general levels of enthusiasm for everyday life.				
05	I am satisfied with my ability to focus or concentrate on everyday tasks.				
06	I am satisfied with the overall quality of my life.				
07	I am satisfied with my general physical health.				
08	I am satisfied with myself; with who I am.				
09	I am satisfied with the support I get from my family.				
10	I am satisfied with the community where I live.				

Appendix K: Participant Information Sheet: Clinical Group

Version 3.1

06/08/15

Coventry and Warwickshire Partnership NHS Trust

PARTICIPANT INFORMATION SHEET

Study Title: Understanding What People Think About Themselves

Primary Researcher: Catrin Fagan, Trainee Clinical Psychologist

Supervisor: Dr Tony Colombo, Coventry University

We would like to invite you to take part in a research study. Before you decide whether you want to take part in the study, it is important that you understand why we are doing the research and what it will involve. Please do not hesitate to contact the researcher, or her supervisor, if you have any questions or concerns before deciding whether you want to take part or not.

What is the purpose of the study?
The main aim of this study is to gain a clearer understanding of the many different ways in which we think and feel about ourselves and the world around us. Collecting such information is important because it is believed that each of us possesses a particular pattern of thoughts and feelings which influence how we approach life and how well we manage to cope with the stressful things that can happen to us. If we can learn about these patterns then we may be able to develop treatments and methods of support that will help people with different sorts of mood difficulties such as depression, suicidal thoughts, grief, and distress.

Why have I been asked to take part?
This is a large research study and you have been asked to take part because we are interested in finding out more about patterns of thoughts and feelings across a broad range of men and women, between the age of 18 and 45, who have had different experiences in life.

What will be involved if I agree to take part?
The study involves completing several questionnaires. To make completing these questionnaires as easy as possible, you will only be asked to tick whether you agree or disagree with each question that you are asked. The researcher will be available to provide information about the study and answer questions. The questionnaires will ask about a range of things, including: how you think, how you manage your feelings, and how you approach problems. We also need to ask about your mental health wellbeing which will include questions on sensitive issues such as: depression, suicidal thoughts and actions.

It is expected that completing these questionnaires will take between 35 to 40 minutes of your time. You can complete the questionnaires in your own time and at your own pace. You will be able to stop for a comfort break at any time.

If you choose to take part, you will be asked to complete a consent form to indicate that you have read and understood this participant information sheet. You will also be asked to answer 4 questions before beginning; these are about your experience, or otherwise, of suicidal thoughts. If we feel concerned about your safety and wellbeing, we will ask you not to participate, and can help you in accessing support. Depending on your circumstances, this may be a mental health charity or a health care professional. With your permission, your GP and a health care professional working with you at your day hospital will also be informed that you are taking part, but they will not be given information about any of your answers.

Coventry & Warwickshire Partnership NHS Trust
Wayside House, Wilsons Lane, Coventry, CV6 6NY
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Please note, even if you decide to take part in the study, you can still change your mind and decide not to continue at any time while completing the questionnaires, and even afterwards you can still withdraw from the study within two weeks of taking part. If you withdraw, your responses will be deleted. Your decision to participate or not will have no impact on any current or future support services you receive.

What are the possible disadvantages or risks of taking part?
We will be asking you about your personal thoughts and feeling about a range of subjects and sometimes this can be quite upsetting. To make sure you are as safe and supported as possible, we ask that you carefully consider whether this is the right time for you to participate in such research, and whether you feel you have support in place. We will be able to point you in the right direction for help and support if you wish. If we are concerned about your safety and wellbeing, we will help you to access support.

What are the possible benefits of taking part?
Participants will not directly receive any rewards for taking part in the research study. However, you may find the questionnaires interesting to complete and you will have the opportunity to receive feedback about the results of the study when it is finished, which you may also find interesting. It is hoped that the findings will contribute to the development of treatments and methods of support will help people with different sorts of mood difficulties such as depression, suicidal thoughts, grief, and distress.

Will my information be kept confidential?
Yes. You will be assigned a participant number to keep your responses as anonymous as possible. Your questionnaire responses and consent forms will be stored securely, in locked filing storage boxes, and will be destroyed by the researcher upon completion of the study. We will change your questionnaire responses into numerical scores and these will be stored as electronic information on a secure University hard drive, which will be password protected and accessible only by the researcher and supervisor. Everyone's responses will be summed together and so it will not be possible to identify individuals in the study.

Ethical approval
The study has been granted ethical approval by the University of Coventry (Ref: P28924) and the Black Country Research Ethics Committee.

Contact for further information

Primary Researcher:
Catrin Fagan faganc3@coventry.ac.uk
Clinical Psychology Doctorate Programme, Coventry University, Faculty of Health and Life Sciences, James Starley Building, Priory Street, Coventry, CV1 5FB.

Supervisor:
Dr Tony Colombo a.colombo@coventry.ac.uk
Clinical Psychology Doctorate Programme, Coventry University, Faculty of Health and Life Sciences, James Starley Building, Priory Street, Coventry, CV1 5FB.

If you require further support due to any of the issues discussed, please speak to a mental health professional involved in your care, or contact your GP.

Alternatively, you may find it helpful to contact the following mental health charities:

Mind
Based at: Wellington Gardens, Windsor Street, Coventry, CV1 3BT
Contact: 024 7655 2874; also National Helpline: 0300 123 3393; and text service: 86463
Website: www.mind.org.uk

Mental Health Matters
24-hour helpline: 0800 616171; and Web Chat: timeonline@mentalhealthmatters.co.uk
Also mobile no: 0300 3305487; and text service: 07786 202242
Website: www.mhm.org.uk

Samaritans
24-hour helpline: 08457 90 90 90; Website: www.samaritans.org

If you wish to make a complaint, you can contact Coventry and Warwickshire Partnership NHS Trust's **Patient Advice & Liaison Service (PALS):**

PALS and Complaints
Based at: Wayside House, Wilsons Lane, Coventry, CV6 6NY
Freephone: 0800 212445
Telephone: 024 7653 6804 / 024 7653 6800
Email: PALS.complaints@covwarkpt.nhs.uk

Appendix L: Participant Information Sheet: Control Group

Version 3.2

06/08/15

Coventry and Warwickshire Partnership NHS Trust

PARTICIPANT INFORMATION SHEET

Study Title: Understanding What People Think About Themselves

Primary Researcher: Catrin Fagan, Trainee Clinical Psychologist

Supervisor: Dr Tony Colombo, Coventry University

We would like to invite you to take part in a research study. Before you decide whether you want to take part in the study, it is important that you understand why we are doing the research and what it will involve. Please do not hesitate to contact the researcher, or her supervisor, if you have any questions or concerns before deciding whether you want to take part or not.

What is the purpose of the study?
The main aim of this study is to gain a clearer understanding of the many different ways in which we think and feel about ourselves and the world around us. Collecting such information is important because it is believed that each of us possesses a particular pattern of thoughts and feelings which influence how we approach life and how well we manage to cope with the stressful things that can happen to us. If we can learn about these patterns then we may be able to develop treatments and methods of support that will help people with different sorts of mood difficulties such as depression, suicidal thoughts, grief, and distress.

Why have I been asked to take part?
This is a large research study and you have been asked to take part because we are interested in finding out more about patterns of thoughts and feelings across a broad range of men and women, between the age of 18 and 45, who have had different experiences in life.

What will be involved if I agree to take part?
The study involves completing several questionnaires. To make completing these questionnaires as easy as possible, you will only be asked to tick whether you agree or disagree with each question that you are asked. The researcher will be available to provide information about the study and answer questions. The questionnaires will ask about a range of things, including: how you think, how you manage your feelings, and how you approach problems. We also need to ask about your mental health wellbeing which will include questions on sensitive issues such as: depression, suicidal thoughts and actions.

It is expected that completing these questionnaires will take between 35 to 40 minutes of your time. You can complete the questionnaires in your own time and at your own pace. You will be able to stop for a comfort break at any time.

If you choose to take part, you will be asked to complete a consent form to indicate that you have read and understood this participant information sheet. You will also be asked to answer 4 questions before beginning; these are about your experience, or otherwise, of suicidal thoughts. If we feel concerned about your safety and wellbeing, we will ask you not to participate, and can help you in accessing support. Depending on your circumstances, this may be student support services, a mental health charity or a health care professional. With your permission, your GP will also be informed that you are taking part, but they will not be given information about any of your answers.

Please note, even if you decide to take part in the study, you can still change your mind and decide not to continue at any time while completing the questionnaires, and even afterwards you can still withdraw from the study within two weeks of taking part. If you withdraw, your responses will be deleted. Your decision to participate or not will have no impact on any current or future support services you receive.

What are the possible disadvantages or risks of taking part?

We will be asking you about your personal thoughts and feeling about a range of subjects and sometimes this can be quite upsetting. To make sure you are as safe and supported as possible, we ask that you carefully consider whether this is the right time for you to participate in such research, and whether you feel you have support in place. We will be able to point you in the right direction for help and support if you wish. If we are concerned about your safety and wellbeing, we will help you to access support.

What are the possible benefits of taking part?

Participants will not directly receive any rewards for taking part in the research study. However, you may find the questionnaires interesting to complete and you will have the opportunity to receive feedback about the results of the study when it is finished, which you may also find interesting. It is hoped that the findings will contribute to the development of treatments and methods of support will help people with different sorts of mood difficulties such as depression, suicidal thoughts, grief, and distress.

Will my information be kept confidential?

Yes. You will be assigned a participant number to keep your responses as anonymous as possible. Your questionnaire responses and consent forms will be stored securely, in locked filing storage boxes, and will be destroyed by the researcher upon completion of the study. We will change your questionnaire responses into numerical scores and these will be stored as electronic information on a secure University hard drive, which will be password protected and accessible only by the researcher and supervisor. Everyone's responses will be summed together and so it will not be possible to identify individuals in the study.

Ethical approval

The study has been granted ethical approval by the University of Coventry (Ref: P28924) and the Black Country Research Ethics Committee.

Contact for further information

Primary Researcher:
Catrin Fagan faganc3@coventry.ac.uk
Clinical Psychology Doctorate Programme, Coventry University, Faculty of Health and Life Sciences, James Starley Building, Priory Street, Coventry, CV1 5FB.

Supervisor:
Dr Tony Colombo a.colombo@coventry.ac.uk
Clinical Psychology Doctorate Programme, Coventry University, Faculty of Health and Life Sciences, James Starley Building, Priory Street, Coventry, CV1 5FB.

If you require further support due to any of the issues discussed, please speak to your GP; or if relevant, a mental health professional involved in your care.

You may find it helpful to contact the following student support services:

Coventry University Student Counselling and Mental Health Team
Contact: 024 7765 8029
Email: counsell.ss@coventry.ac.uk

Coventry University Welfare Team
Contact: 024 7765 8029
Email: welfare.ss@coventry.ac.uk

Coventry University Students Union
http://www.cusu.org

Alternatively, you may wish to contact the following:

Mind
Based at: Wellington Gardens, Windsor Street, Coventry, CV1 3BT
Contact: 024 7655 2874; also National Helpline: 0300 123 3393; and text service: 86463
Website: www.mind.org.uk

Mental Health Matters
24-hour helpline: 0800 616171; and Web Chat: timeonline@mentalhealthmatters.co.uk
Also mobile no: 0300 3305487; and text service: 07786 202242
Website: www.mhm.org.uk

Samaritans
24-hour helpline: 08457 90 90 90; Website: www.samaritans.org

If you wish to make a complaint, you can contact Coventry and Warwickshire Partnership NHS Trust's **Patient Advice & Liaison Service (PALS):**

PALS and Complaints
Based at: Wayside House, Wilsons Lane, Coventry, CV6 6NY
Freephone: 0800 212445
Telephone: 024 7653 6804 / 024 7653 6800
Email: PALS.complaints@covwarkpt.nhs.uk

Appendix M: Participant Consent Form

Version 3.1

06/08/15

Coventry and Warwickshire Partnership NHS Trust

CONSENT FORM

Study Title: Understanding What People Think About Themselves

A study by: Catrin Fagan and Tony Colombo
Coventry & Warwick Universities Doctorate in Clinical Psychology

Please read each of the following statements and initial in the boxes:

1. I confirm I have read and understood the attached Participant Information Sheet and by signing below I consent to participate in this study. ☐
2. I have had the opportunity to ask questions about this study and I know how to contact the researcher or her supervisor if I need to. ☐
3. I understand that I have the right to withdraw at any time during the study and within two weeks after I participate. ☐
4. I am taking part in this study voluntarily. ☐
5. I give permission for my GP to be informed that I am taking part in this study. ☐

Name of Participant	Date	Signature
Name of Researcher	Date	Signature

Contact for Further Information:

Catrin Fagan Trainee Clinical Psychologist — Clinical Psychology Doctorate, Faculty of Health and Life Sciences, Coventry University, Priory Street, Coventry, CV1 5FB — Tel: 024 7688 7630, Email: faganc3@coventry.ac.uk

Dr Tony Colombo Research Supervisor — Clinical Psychology Doctorate, Faculty of Health and Life Sciences, Coventry University, Priory Street, Coventry, CV1 5FB — Tel: 024 7688 7630, Email: a.colombo@coventry.ac.uk

Appendix N: Participant Debrief Sheet

Version 2

27/05/15

Coventry and Warwickshire Partnership NHS Trust

DEBRIEF

Study Title: Understanding What People Think About Themselves

Thank you very much for taking part in this research.

This research asked you a range of questions about things like how you think, how you manage your feelings, and how you approach problems. It also asked you about your experience of symptoms associated with depression and of suicidal thoughts or actions, along with some questions about your personality and resilience.

We asked participants with different experiences to complete the same questionnaires, as part of two separate groups: 1) a group who have experienced suicidal thoughts or actions; and 2) a group who have never experienced suicidal thoughts or actions. We hope that by combining your responses with those of other participants, we will learn more about patterns of thoughts and feelings, or "mentalisation", and how these patterns relate to thoughts and actions around self-harm and suicide. If a link between mentalisation and suicidal thoughts or behaviour is found, the research may be able to develop treatments that will help predict who may be more likely to experience suicidal thoughts or behaviour, and help sufferers cope with their mental health difficulties.

Your questionnaire responses will now be analysed along with the responses of other participants. All the data will be kept confidential and you will not be identifiable in the report of the research. All the data will be stored securely, in locked filing storage boxes and in password protected computer files on a secure University server. The questionnaires will be destroyed by the researcher upon completion of the study.

If you wish to withdraw from the research, you can do so without providing any reason. Simply contact one of the research team (details below) within two weeks of taking part in order for us to remove your data from the research.

The final report for this research will be completed by September 2016. If you wish, you can receive information about the findings of the research. Information about the study's findings will be available through Coventry University's Research Blog, and through Coventry University's Twitter feed (@clinpsychcovuni). Please contact one of the research team if you would like to receive a summary of the findings.

If you have any further questions please do not hesitate to contact one of the research team.

Contact Details

Catrin Fagan: faganc3@coventry.ac.uk
Dr Tony Colombo: a.colombo@coventry.ac.uk

If you require further support due to any of the issues discussed, please contact your GP; or if relevant, any mental health professional currently involved in your care.

Philip Bushill-Matthews – Interim Chair
Rachel Newson – Chief Executive

Coventry & Warwickshire Partnership NHS Trust
Wayside House, Wilsons Lane, Coventry, CV6 6NY
Tel: 024 7636 2100 Fax: 024 7636 8949
www.covwarkpt.nhs.uk

MINDFUL EMPLOYER

in partnership with:

Warwickshire County Council

Appendix O: Confirmation of Coventry University Ethical Approval

Certificate of Ethical Approval

Applicant:

Catrin Fagan

Project Title:

Exploring Patterns of Mentalisation: Understanding What People Think About Themselves

This is to certify that the above named applicant has completed the Coventry University Ethical Approval process and their project has been confirmed and approved as Medium Risk

Date of approval:

09 June 2015

Project Reference Number:

P28924

Appendix P: Research Ethics Committee Approval

NHS
Health Research Authority
NRES Committee West Midlands - The Black Country
Royal Standard Place
Nottingham
NG1 6FS

Telephone: 0115 883 9435

12 August 2015

Miss Catrin Fagan
Trainee Clinical Psychologist
Coventry and Warwickshire NHS Partnership Trust
Coventry University, Clinical Psychology Doctorate Programme
Priory Street
Coventry
CV15FB

Dear Miss Fagan

Study title:	**Exploring Patterns of Mentalisation: Understanding What People Think About Themselves**
REC reference:	**15/WM/0246**
Protocol number:	**N/A**
IRAS project ID:	**181473**

Thank you for your submission of 11 August 2015, responding to the Committee's request for further information on the above research and submitting revised documentation.

The further information has been considered on behalf of the Committee by the Chair.

We plan to publish your research summary wording for the above study on the HRA website, together with your contact details. Publication will be no earlier than three months from the date of this favourable opinion letter. The expectation is that this information will be published for all studies that receive an ethical opinion but should you wish to provide a substitute contact point, wish to make a request to defer, or require further information, please contact the REC Manager, Miss Georgia Copeland, nrescommittee.westmidlands-blackcountry@nhs.net. Under very limited circumstances (e.g. for student research which has received an unfavourable opinion), it may be possible to grant an exemption to the publication of the study.

Confirmation of ethical opinion

On behalf of the Committee, I am pleased to confirm a favourable ethical opinion for the above research on the basis described in the application form, protocol and supporting documentation as revised, subject to the conditions specified below.

Conditions of the favourable opinion

The favourable opinion is subject to the following conditions being met prior to the start of the study.

Management permission or approval must be obtained from each host organisation prior to the start of the study at the site concerned.

Management permission ("R&D approval") should be sought from all NHS organisations involved in the study in accordance with NHS research governance arrangements.

Guidance on applying for NHS permission for research is available in the Integrated Research Application System or at http://www.rdforum.nhs.uk.

Where a NHS organisation's role in the study is limited to identifying and referring potential participants to research sites ("participant identification centre"), guidance should be sought from the R&D office on the information it requires to give permission for this activity.

For non-NHS sites, site management permission should be obtained in accordance with the procedures of the relevant host organisation.

Sponsors are not required to notify the Committee of approvals from host organisations

Registration of Clinical Trials

All clinical trials (defined as the first four categories on the IRAS filter page) must be registered on a publically accessible database. This should be before the first participant is recruited but no later than 6 weeks after recruitment of the first participant.

There is no requirement to separately notify the REC but you should do so at the earliest opportunity e.g. when submitting an amendment. We will audit the registration details as part of the annual progress reporting process.

To ensure transparency in research, we strongly recommend that all research is registered but for non-clinical trials this is not currently mandatory.

If a sponsor wishes to request a deferral for study registration within the required timeframe, they should contact hra.studyregistration@nhs.net. The expectation is that all clinical trials will be registered, however, in exceptional circumstances non registration may be permissible with prior agreement from NRES. Guidance on where to register is provided on the HRA website.

It is the responsibility of the sponsor to ensure that all the conditions are complied with before the start of the study or its initiation at a particular site (as applicable).

Ethical review of research sites

NHS sites

The favourable opinion applies to all NHS sites taking part in the study, subject to management permission being obtained from the NHS/HSC R&D office prior to the start of the study (see

"Conditions of the favourable opinion" below).

Non-NHS sites

Approved documents

The final list of documents reviewed and approved by the Committee is as follows:

Document	*Version*	*Date*
Evidence of Sponsor insurance or indemnity (non NHS Sponsors only) [Evidence of Indemnity]	1	10 June 2015
GP/consultant information sheets or letters	1	
IRAS Checklist XML [Checklist_11082015]		11 August 2015
Letter from sponsor [Letter from sponsor]	1	09 June 2015
Participant consent form [Consent form clinical group]	3-1	06 August 2015
Participant consent form [Consent form control group]	3-2	06 August 2015
Participant information sheet (PIS) [Debrief Form]	2	27 May 2015
Participant information sheet (PIS) [PIS clinical group]	3-1	06 August 2015
Participant information sheet (PIS) [PIS control group]	3-2	06 August 2015
REC Application Form [REC_Form_30062015]		30 June 2015
Research protocol or project proposal [Research Protocol]	2	27 May 2015
Summary CV for Chief Investigator (CI) [CV for CI]	2	02 June 2015
Summary CV for supervisor (student research) [CV for Supervisor]	2	01 June 2015
Validated questionnaire [Questionnaires]	1	27 May 2015
Validated questionnaire [Screening Questionnaire]	1	27 May 2015

Statement of compliance

The Committee is constituted in accordance with the Governance Arrangements for Research Ethics Committees and complies fully with the Standard Operating Procedures for Research Ethics Committees in the UK.

After ethical review

Reporting requirements

The attached document *"After ethical review – guidance for researchers"* gives detailed guidance on reporting requirements for studies with a favourable opinion, including:

- Notifying substantial amendments
- Adding new sites and investigators
- Notification of serious breaches of the protocol
- Progress and safety reports
- Notifying the end of the study

The HRA website also provides guidance on these topics, which is updated in the light of changes in reporting requirements or procedures.

User Feedback

The Health Research Authority is continually striving to provide a high quality service to all applicants and sponsors. You are invited to give your view of the service you have received and the application procedure. If you wish to make your views known please use the feedback form available on the HRA website:
http://www.hra.nhs.uk/about-the-hra/governance/quality-assurance/

HRA Training

We are pleased to welcome researchers and R&D staff at our training days – see details at http://www.hra.nhs.uk/hra-training/

15/WM/0246	Please quote this number on all correspondence

With the Committee's best wishes for the success of this project.

Yours sincerely

PP

Dr Hilary Paniagua
Chair

Email:nrescommittee.westmidlands-blackcountry@nhs.net

Enclosures: "After ethical review – guidance for researchers"

Copy to: *Professor Ian Marshall,*
Louise Alston, NIHR CRN: West Midlands

Appendix Q: Research and Development (R&D) Approval

Coventry and Warwickshire Partnership NHS
NHS Trust

National Institute for Health Research
Clinical Research Network: West Midlands
Binley Business Park
Harry Weston Road
Coventry
CV3 2TX

05 October 2015

Miss Catrin Fagan
Trainee Clinical Psychologist
Coventry and Warwickshire Partnership NHS Trust / Coventry University
Coventry University
Priory Street
Coventry
CV1 5FB

Dear Miss Fagan

Project Title: Exploring Patterns of Mentalisation: Understanding What People Think About Themselves
R&D Ref: CWPT230915D
REC Ref: 15/WM/0246

I am pleased to inform you that the R&D review of the above project is complete, and NHS permission has been granted for the study at Coventry and Warwickshire Partnership NHS Trust. The details of your study have now been entered onto the Trust's database.

The permission has been granted on the basis described in the application form, protocol and supporting documentation. The documents reviewed were:

Document	Version	Date
REC Favourable Opinion Letter	-	12/08/2015
Protocol	2	27/05/2015
GP/consultant information sheets or letters	1	27/05/2015
Participant consent form clinical group	3.1	06/08/2015
Participant information sheet (PIS) [Debrief Form]	2	27/05/2015
Participant information sheet (PIS) clinical group	3.1	06/08/2015
Validated questionnaires	1	27/05/2015
Validated questionnaire [Screening Questionnaire]	1	27/05/2015
R&D form	181473/808244/14/60	
SSI form	181473/826111/6/606/287454/329056	

All research must be managed in accordance with the requirements of the Department of Health's Research Governance Framework (RGF), to ICH-GCP standards (if applicable) and to NHS Trust policies and procedures. Permission is only granted for the activities agreed by the relevant authorities.

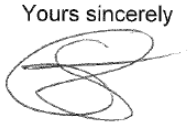
All amendments (including changes to the local research team and status of the project) need to be submitted to the REC and the R&D office in accordance with the guidance in IRAS. Any urgent safety measures required to protect research participants against immediate harm can be implemented immediately. You should notify the R&D Office within the same time frame as any other regulatory bodies.

It is your responsibility to keep the R&D Office and Sponsor informed of all Serious Adverse Events. All SAEs must be reported within the timeframes detailed within ICH-GCP statutory instruments and EU directives.

In order to ensure that research is carried out to the highest governance standards, the Trust employs the services of an external monitoring organisation to provide assurance. Your study may be randomly selected for audit at any time, and you must co-operate with the auditors. Action may be taken to suspend Trust approval if the research is not run in accordance with RGF or ICH-GCP standards, or following recommendations from the auditors.

I wish you well with your project. Please do not hesitate to contact me should you need any guidance or assistance.

Yours sincerely



Shelley Grant
Research Support Facilitator
Job Title

Copy: Christine Laking, Consultant Clinical Psychologist, CWPT

Appendix R: Full Data Analyses

Below can be found a full account of the data analyses for this study.

Question (Q) / Hypothesis (Ho):
The study was in the form of a cross-sectional survey design and aimed to maximise variation amongst participants in terms of the different conditions of suicidality.

To start, the sample population were organised into the different groups that will be used in order to represent the various stages of suicidality:

- Never (have never thought about or attempted to kill myself);
- Thinkers (have had brief, passing thought about killing myself);
- Planners (have made plans at least once to kill myself and really wanted to die);
- Attempters (have attempted to kill myself and really wanted to die).

This sample distribution can be examined using the first item on the Suicidal Behaviors Questionnaire-Revised (SBQ01), which is both a nominal (categorical) and ordinal/interval variable (i.e., suicidality has a theoretical logic in terms of intensity).

Testing the Ho: There is no significant difference in the number of participants sampled between each of the four suicidality groups – Nevers, Thinkers, Planners and Attempters.

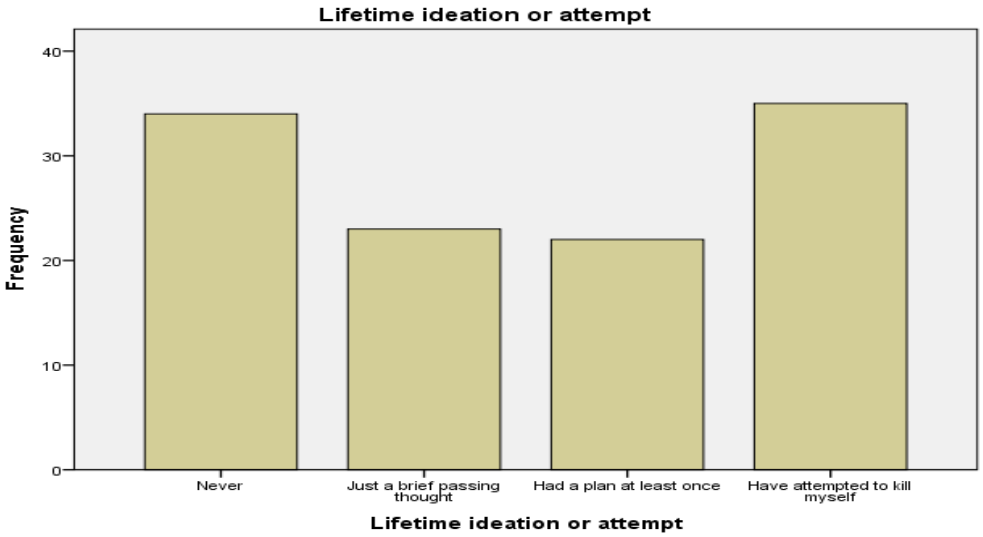
In other words, the number of participants within each group is broadly equal and so no oversampling has occurred. If the Ho has to be rejected, then the options are either: 1) weight the results based on the unequal distribution of participants across the four suicidality groups or 2) randomly remove participants from suicidality groups until participants are equally distributed.

Type of Analysis:
In order to test this Ho, a **Frequencies Table, Bar Chart** and a **Chi-Square (goodness of fit) test (**also known as a **one-sample Chi-Square test**) will be used.

Results:

SBQ01: Lifetime ideation or attempt

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Never	34	29.8	29.8	29.8
	Just a brief passing thought	23	20.2	20.2	50.0
	Had a plan at least once	22	19.3	19.3	69.3
	Have attempted to kill myself	35	30.7	30.7	100.0
	Total	114	100.0	100.0	



Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
1	The categories of Lifetime ideation or attempt occur with equal probabilities.	One-Sample Chi-Square Test	.165	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

Test Statistics

	Lifetime ideation or attempt
Chi-Square	5.088[a]
df	3
Asymp. Sig.	.165

a. 0 cells (0.0%) have expected frequencies less than 5.

The minimum expected cell frequency is 28.5.

Conclusion:

As the Chi-Square test was not significant (0.165), it can be concluded that the Ho was not rejected. Thus, although there are a different number of participants within each suicidality group, their probability differences are not significantly different. As such, the groups can be treated as equal for the purpose of future analyses.

The frequencies table above shows that participants are represented in each of the four groups, but that the distribution is slightly unbalanced (although not significantly so). One option is to reduce the four groups to two groups: Non-suicidal (control) and Suicidal (clinical). This would require creating a purely categorical variable. The distribution would be Non-suicidal (*n* = 57) and Suicidal (*n* = 57). This would be more balanced, but less versatile for analysis purposes. This will be revisited, as a categorical dependent variable will need to be used for some of the analyses. However, in the meantime, the sample population will remain divided into four groups representing stages of suicidality.

Question (Q) / Hypothesis (Ho):

According to the literature on the SBQ-R (e.g. Osman et al., 2001), the Total Score is a reliable indicator of the specific risk of suicide. As such, each of the four suicidality groups should differ in terms of the risk they present. It may be expected that the Total Score be below 7/8 for the Nevers group and above 8 (and incremental) for the other three suicidality groups: Thinkers, Planners and Attempters. Thus, as the sum of the SBQ-R represents the overall risk of suicidality, significant differences in Total Scores may be expected between each of the four suicidality groups. The Ho would therefore be: there is no difference in the overall risk of suicide between the four suicidality groups as measured by SBQ01Groups3 (low, medium and high scores).

Type of Analysis:

In order to test this Ho, a **Chi-Square test for independence** was used. This test compares the frequency of cases found in the categories of one variable (Risk Rating: low (0-7), medium (8-13) and high14-19) across the different categories of another variable (Suicidality).

Results:

Suicide Risk Groups * Lifetime ideation or attempt Crosstabulation

Suicide Risk Groups			Lifetime ideation or attempt				
			Never	Just a brief passing thought	Had a plan at least once	Have attempted to kill myself	Total
Low	0-7	Count	34	23	1	1	59
		Expected Count	17.6	11.9	11.4	18.1	59.0
		% within Suicide Risk Groups	57.6%	39.0%	1.7%	1.7%	100.0%
		% within Lifetime ideation or attempt	100.0%	100.0%	4.5%	2.9%	51.8%
		% of Total	29.8%	20.2%	0.9%	0.9%	51.8%
Medium	8-13	Count	0	0	16	14	30
		Expected Count	8.9	6.1	5.8	9.2	30.0
		% within Suicide Risk Groups	0.0%	0.0%	53.3%	46.7%	100.0%
		% within Lifetime ideation or attempt	0.0%	0.0%	72.7%	40.0%	26.3%
		% of Total	0.0%	0.0%	14.0%	12.3%	26.3%
High	14-19	Count	0	0	5	20	25
		Expected Count	7.5	5.0	4.8	7.7	25.0
		% within Suicide Risk Groups	0.0%	0.0%	20.0%	80.0%	100.0%
		% within Lifetime ideation or attempt	0.0%	0.0%	22.7%	57.1%	21.9%
		% of Total	0.0%	0.0%	4.4%	17.5%	21.9%
Total		Count	34	23	22	35	114
		Expected Count	34.0	23.0	22.0	35.0	114.0
		% within Suicide Risk Groups	29.8%	20.2%	19.3%	30.7%	100.0%
		% within Lifetime ideation or attempt	100.0%	100.0%	100.0%	100.0%	100.0%
		% of Total	29.8%	20.2%	19.3%	30.7%	100.0%

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	119.073[a]	6	.000
Likelihood Ratio	147.348	6	.000
Linear-by-Linear Association	79.988	1	.000
N of Valid Cases	114		

Conclusion:
As the Chi-Square statistic is significant (0.0005), the Ho was rejected. Thus, it can be concluded that the suicidality groups differ in terms or their level of suicidal risk. Observing the data in the table above identifies where these differences are located. Risk levels seem to be low in Nevers and Thinkers but high for Planners and Attempters. As reported in the literature, SBQ01 and total scores seem to be a useful measure for differentiating those at risk of suicide.

Question (Q) / Hypothesis (Ho):
The next step is to understand something about the nature of each suicidality group in terms of their suicidal characteristics. This means looking at the results from the other key questions within the SBQ-R:
Q2 is about the frequency of suicidal thoughts in past year;
Q3 is really about frequency of planning; and
Q4 is about likelihood of future attempts.

As the characteristics within groups are being considered, the question to be addressed is: What are the main suicidal characteristics within each of the four suicidality groups?

Type of Analysis:
In order to answer this question, basic descriptive **Frequency Tables** were used.

Results:

TABLE 1: Frequency ideation in last year * Lifetime ideation or attempt Crosstabulation
Count

		Lifetime ideation or attempt				
		Never	Just a brief passing thought	Had a plan at least once	Have attempted to kill myself	Total
Frequency ideation in last year	Never	34	20	1	1	56
	Rarely	0	3	6	2	11
	Sometimes	0	0	2	1	3
	Often	0	0	5	12	17
	Very often	0	0	8	19	27
Total		34	23	22	35	114

TABLE 2: Threat of suicide attempt * Lifetime ideation or attempt Crosstabulation
Count

		Lifetime ideation or attempt				
		Never	Just a brief passing thought	Had a plan at least once	Have attempted to kill myself	Total
Threat of suicide attempt	No	34	23	6	4	67
	Yes once	0	0	5	4	9
	Yes more than once	0	0	11	27	38
Total		34	23	22	35	114

TABLE 3: Likelihood of future suicide attempt * Lifetime ideation or attempt Crosstabulation
Count

		Lifetime ideation or attempt				
		Never	Just a brief passing thought	Had a plan at least once	Have attempted to kill myself	Total
Likelihood of future suicide attempt	Never	21	8	2	1	32
	No chance at all	11	14	1	2	28
	Rather unlikely	2	1	10	3	16
	Unlikely	0	0	3	11	14
	Likely	0	0	6	14	20
	Rather likely	0	0	0	2	2
	Very likely	0	0	0	2	2
Total		34	23	22	35	114

Conclusion:

The patterns are broadly as expected.

TABLE 1:

1) The Thinkers group contains only 3 participants who have had suicidal thoughts in past year (though all 23 claim to have had such thoughts at some point during their lifetime, which makes them distinctive from Nevers);

2) The Never Group are consistent in reporting no ideations in the past year. Such findings could be used to challenge claims of a ‘response set’ approach to answering the questionnaire (i.e., just randomly filling in boxes);

3) The Planner and Attempter Groups have (for all but 1 participant) taken some action within the past year.;

4) Frequencies within the Attempt Group are much higher than for the Planning Group.

TABLE 2:

1) For Never and Thinker Groups, no reported attempts suggest that there was no participant reporting bias;

2) Majority of the Planner Group are serious in their goal as they actively told someone that they felt suicidal;
3) This is also the case for those in the Attempts Group where frequency of reported threats is much higher (27 out of 35 for more than once).
TABLE 3:
1) All participants in Groups 1 and 2 have no future plans.
2) There seems to be important differences between Planners and Attempts with the latter much more likely to make an attempt in the future (Attempters 18 out of 35; Planners 6 out of 22).

Question (Q) / Hypothesis (Ho):
As the principal aim of the analysis is to look for differences between the four suicidality groups, it needs to be ensured that this variable is the most dominant attribute within the sample population. At least that it is the most dominant variable relative to those measured. Here the attempt is to seek out contaminants (variables which may distort any differences that might be found). These include differences in: Gender, Age, Education, Relationships, Mental Health Difficulties and Personality.

Thus, the Ho being tested is: There is no significant difference in key psycho-social demographic variables between each of the four suicidality groups (Nevers, Thinkers, Planners and Attempters).
This Ho can also be reformulated into a series of questions:
Q: Are there differences in Gender across the four suicidality groups?
Q: Are there differences is Age across the four suicidality groups?
Q: Are there differences in Relationship Status across the four suicidality groups?
Q: Are there differences in Educational Achievement across the four suicidality groups?
Q: Are there differences in Mental Health Difficulties across the four suicidality groups?
Q: Are there differences in Personality across the four suicidality groups?

Where there are differences, forcing rejection of the Ho, either: 1) a theoretical / evidence-based rational will be provided as to why a particular difference is not that important for the purposes of this study; or 2) any identified differences will be included as part of the data analysis process.

Type of Analysis:
In order to test this Ho (or research questions), a series of **Chi-Square tests for independence** need to be conducted. This test compares the frequency of cases found in the categories of one variable (Gender, Age, Personality, etc) across the different categories of another variable (Suicidality).

Results:

Q: Are there differences in Gender across the four suicidality groups?

Gender * Lifetime ideation or attempt Crosstabulation

Gender		Lifetime ideation or attempt				
		Never	Just a brief passing thought	Had a plan at least once	Have attempted to kill myself	Total
Male	Count	20	8	8	20	56
	Expected Count	16.7	11.3	10.8	17.2	56.0
	% within Gender	35.7%	14.3%	14.3%	35.7%	100.0%
	% within Lifetime ideation or attempt	58.8%	34.8%	36.4%	57.1%	49.1%
	% of Total	17.5%	7.0%	7.0%	17.5%	49.1%
Female	Count	14	15	14	15	58
	Expected Count	17.3	11.7	11.2	17.8	58.0
	% within Gender	24.1%	25.9%	24.1%	25.9%	100.0%
	% within Lifetime ideation or attempt	41.2%	65.2%	63.6%	42.9%	50.9%
	% of Total	12.3%	13.2%	12.3%	13.2%	50.9%
Total	Count	34	23	22	35	114
	Expected Count	34.0	23.0	22.0	35.0	114.0
	% within Gender	29.8%	20.2%	19.3%	30.7%	100.0%
	% within Lifetime ideation or attempt	100.0%	100.0%	100.0%	100.0%	100.0%
	% of Total	29.8%	20.2%	19.3%	30.7%	100.0%

Chi-Square Tests	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	5.507[a]	3	.138
Likelihood Ratio	5.568	3	.135
Linear-by-Linear Association	.006	1	.940
N of Valid Cases	114		

Results:

Q: Are there differences in Age across the four suicidality groups?

Age by Group * Lifetime ideation or attempt Crosstabulation

Age by Group (using the median of 37 as cut off point)			Lifetime ideation or attempt				
			Never	Just a brief passing thought	Had a plan at least once	Have attempted to kill myself	Total
Age by Group	18-37	Count	16	12	13	16	57
		Expected Count	17.0	11.5	11.0	17.5	57.0
		% within Age by Group	28.1%	21.1%	22.8%	28.1%	100.0%
		% within Lifetime ideation or attempt	47.1%	52.2%	59.1%	45.7%	50.0%
		% of Total	14.0%	10.5%	11.4%	14.0%	50.0%
	38-78	Count	18	11	9	19	57
		Expected Count	17.0	11.5	11.0	17.5	57.0
		% within Age by Group	31.6%	19.3%	15.8%	33.3%	100.0%
		% within Lifetime ideation or attempt	52.9%	47.8%	40.9%	54.3%	50.0%
		% of Total	15.8%	9.6%	7.9%	16.7%	50.0%
Total		Count	34	23	22	35	114
		Expected Count	34.0	23.0	22.0	35.0	114.0
		% within Age by Group	29.8%	20.2%	19.3%	30.7%	100.0%
		% within Lifetime ideation or attempt	100.0%	100.0%	100.0%	100.0%	100.0%
		% of Total	29.8%	20.2%	19.3%	30.7%	100.0%

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	1.146[a]	3	.766
Likelihood Ratio	1.150	3	.765
Linear-by-Linear Association	.000	1	1.000
N of Valid Cases	114		

Results:

Q: Are there differences in Relationship Status across the four suicidality groups?

Relationship Status * Lifetime ideation or attempt Crosstabulation

Relationship (Status (married - living together - in a relationship) are recoded as IN a relationship)			Lifetime ideation or attempt				
			Never	Just a brief passing thought	Had a plan at least once	Have attempted to kill myself	Total
IN	1	Count	23	14	11	15	63
		Expected Count	18.8	12.7	12.2	19.3	63.0
		% within Relationship Status	36.5%	22.2%	17.5%	23.8%	100.0%
		% within Lifetime ideation or attempt	67.6%	60.9%	50.0%	42.9%	55.3%
		% of Total	20.2%	12.3%	9.6%	13.2%	55.3%
OUT	2	Count	11	9	11	20	51
		Expected Count	15.2	10.3	9.8	15.7	51.0
		% within Relationship Status	21.6%	17.6%	21.6%	39.2%	100.0%
		% within Lifetime ideation or attempt	32.4%	39.1%	50.0%	57.1%	44.7%
		% of Total	9.6%	7.9%	9.6%	17.5%	44.7%
Total		Count	34	23	22	35	114
		Expected Count	34.0	23.0	22.0	35.0	114.0
		% within Relationship Status	29.8%	20.2%	19.3%	30.7%	100.0%
		% within Lifetime ideation or attempt	100.0%	100.0%	100.0%	100.0%	100.0%
		% of Total	29.8%	20.2%	19.3%	30.7%	100.0%

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	4.827[a]	3	.185
Likelihood Ratio	4.875	3	.181
Linear-by-Linear Association	4.756	1	.029
N of Valid Cases	114		

Conclusion:

As the Chi-Square statistic was not significant, the Ho was not rejected. Thus, it can be concluded that although there are a different number of participants within each suicidality group, their probability differences are not significantly different. As such, the groups can be treated as equal for the purpose of future analyses. They do not differ between groups in terms of Gender, Age (at medium point cut-off) and Relationship Status (in or out of relationship).

Results:

Q: Are there differences in Personality across the four suicidality groups? Looking at total personality and then each of the Big Five Personality Types.

Personality Score * Lifetime ideation or attempt Crosstabulation

Personality Score (high score = Extraversion, Agreeableness, Conscientiousness, Emotional Stability, Openness to Experiences.		Lifetime ideation or attempt				
		Never	Just a brief passing thought	Had a plan at least once	Have attempted to kill myself	Total
Low	1 Count	6	7	17	32	62
	Expected Count	18.5	12.5	12.0	19.0	62.0
	% within Personality Score	9.7%	11.3%	27.4%	51.6%	100.0%
	% within Lifetime ideation or attempt	17.6%	30.4%	77.3%	91.4%	54.4%
	% of Total	5.3%	6.1%	14.9%	28.1%	54.4%
High	2 Count	28	16	5	3	52
	Expected Count	15.5	10.5	10.0	16.0	52.0
	% within Personality Score	53.8%	30.8%	9.6%	5.8%	100.0%
	% within Lifetime ideation or attempt	82.4%	69.6%	22.7%	8.6%	45.6%
	% of Total	24.6%	14.0%	4.4%	2.6%	45.6%
Total	Count	34	23	22	35	114
	Expected Count	34.0	23.0	22.0	35.0	114.0
	% within Personality Score	29.8%	20.2%	19.3%	30.7%	100.0%
	% within Lifetime ideation or attempt	100.0%	100.0%	100.0%	100.0%	100.0%
	% of Total	29.8%	20.2%	19.3%	30.7%	100.0%

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	47.822[a]	3	.000
Likelihood Ratio	53.146	3	.000
Linear-by-Linear Association	45.321	1	.000
N of Valid Cases	114		

Extraversion * Lifetime ideation or attempt Crosstabulation

Used Q1 and Q6 cut off point 1-4 and 5-8		Lifetime ideation or attempt				
		Never	Just a brief passing thought	Had a plan at least once	Have attempted to kill myself	Total
Introversion	Count	6	9	12	26	53
	Expected Count	15.8	10.7	10.2	16.3	53.0
	% within Extraversion	11.3%	17.0%	22.6%	49.1%	100.0%
	% within Lifetime ideation or attempt	17.6%	39.1%	54.5%	74.3%	46.5%
	% of Total	5.3%	7.9%	10.5%	22.8%	46.5%
Extraversion	Count	28	14	10	9	61
	Expected Count	18.2	12.3	11.8	18.7	61.0
	% within Extraversion	45.9%	23.0%	16.4%	14.8%	100.0%
	% within Lifetime ideation or attempt	82.4%	60.9%	45.5%	25.7%	53.5%
	% of Total	24.6%	12.3%	8.8%	7.9%	53.5%
Total	Count	34	23	22	35	114
	Expected Count	34.0	23.0	22.0	35.0	114.0
	% within Extraversion	29.8%	20.2%	19.3%	30.7%	100.0%
	% within Lifetime ideation or attempt	100.0%	100.0%	100.0%	100.0%	100.0%
	% of Total	29.8%	20.2%	19.3%	30.7%	100.0%

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	23.315[a]	3	.000
Likelihood Ratio	24.779	3	.000
Linear-by-Linear Association	23.051	1	.000
N of Valid Cases	114		

NeuroticStable * Lifetime ideation or attempt Crosstabulation

Used Q4 and Q9 cut off point 1-4 and 5-8			Lifetime ideation or attempt				
			Never	Just a brief passing thought	Had a plan at least once	Have attempted to kill myself	Total
Neurotic	1	Count	0	2	16	33	51
		Expected Count	15.2	10.3	9.8	15.7	51.0
		% within NeuroticStable	0.0%	3.9%	31.4%	64.7%	100.0%
		% within Lifetime ideation or attempt	0.0%	8.7%	72.7%	94.3%	44.7%
		% of Total	0.0%	1.8%	14.0%	28.9%	44.7%
Stable	2	Count	34	21	6	2	63
		Expected Count	18.8	12.7	12.2	19.3	63.0
		% within NeuroticStable	54.0%	33.3%	9.5%	3.2%	100.0%
		% within Lifetime ideation or attempt	100.0%	91.3%	27.3%	5.7%	55.3%
		% of Total	29.8%	18.4%	5.3%	1.8%	55.3%
Total		Count	34	23	22	35	114
		Expected Count	34.0	23.0	22.0	35.0	114.0
		% within NeuroticStable	29.8%	20.2%	19.3%	30.7%	100.0%
		% within Lifetime ideation or attempt	100.0%	100.0%	100.0%	100.0%	100.0%
		% of Total	29.8%	20.2%	19.3%	30.7%	100.0%

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	81.336[a]	3	.000
Likelihood Ratio	102.068	3	.000
Linear-by-Linear Association	75.661	1	.000
N of Valid Cases	114		

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 9.84.

Agreeable * Lifetime ideation or attempt Crosstabulation

Agreeable		Lifetime ideation or attempt				Total
		Never	Just a brief passing thought	Had a plan at least once	Have attempted to kill myself	
1 Argumentative	Count	0	0	4	7	11
	Expected Count	3.3	2.2	2.1	3.4	11.0
	% within Agreeable	0.0%	0.0%	36.4%	63.6%	100.0%
	% within Lifetime ideation or attempt	0.0%	0.0%	18.2%	20.0%	9.6%
	% of Total	0.0%	0.0%	3.5%	6.1%	9.6%
2 Agreeable	Count	34	23	18	28	103
	Expected Count	30.7	20.8	19.9	31.6	103.0
	% within Agreeable	33.0%	22.3%	17.5%	27.2%	100.0%
	% within Lifetime ideation or attempt	100.0%	100.0%	81.8%	80.0%	90.4%
	% of Total	29.8%	20.2%	15.8%	24.6%	90.4%
Total	Count	34	23	22	35	114
	Expected Count	34.0	23.0	22.0	35.0	114.0
	% within Agreeable	29.8%	20.2%	19.3%	30.7%	100.0%
	% within Lifetime ideation or attempt	100.0%	100.0%	100.0%	100.0%	100.0%
	% of Total	29.8%	20.2%	19.3%	30.7%	100.0%

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	12.226[a]	3	.007
Likelihood Ratio	16.455	3	.001
Linear-by-Linear Association	10.506	1	.001
N of Valid Cases	114		

a. 4 cells (50.0%) have expected count less than 5. The minimum expected count is 2.12.

Dependable * Lifetime ideation or attempt Crosstabulation

Dependable		Lifetime ideation or attempt				Total
		Never	Just a brief passing thought	Had a plan at least once	Have attempted to kill myself	
1 Disorganised	Count	1	0	3	6	10
	Expected Count	3.0	2.0	1.9	3.1	10.0
	% within Dependable	10.0%	0.0%	30.0%	60.0%	100.0 %
	% within Lifetime ideation or attempt	2.9%	0.0%	13.6%	17.1%	8.8%
	% of Total	0.9%	0.0%	2.6%	5.3%	8.8%
2 Organised	Count	33	23	19	29	104
	Expected Count	31.0	21.0	20.1	31.9	104.0
	% within Dependable	31.7%	22.1%	18.3%	27.9%	100.0 %
	% within Lifetime ideation or attempt	97.1%	100.0%	86.4%	82.9%	91.2%
	% of Total	28.9%	20.2%	16.7%	25.4%	91.2%
Total	Count	34	23	22	35	114
	Expected Count	34.0	23.0	22.0	35.0	114.0
	% within Dependable	29.8%	20.2%	19.3%	30.7%	100.0 %
	% within Lifetime ideation or attempt	100.0 %	100.0%	100.0%	100.0%	100.0 %
	% of Total	29.8%	20.2%	19.3%	30.7%	100.0 %

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	7.371[a]	3	.061
Likelihood Ratio	9.150	3	.027
Linear-by-Linear Association	5.909	1	.015
N of Valid Cases	114		

a. 4 cells (50.0%) have expected count less than 5. The minimum expected count is 1.93.

Open2Experiences * Lifetime ideation or attempt Crosstabulation

Open2Experiences		Lifetime ideation or attempt				
		Never	Just a brief passing thought	Had a plan at least once	Have attempted to kill myself	Total
1 closed	Count	1	3	6	13	23
	Expected Count	6.9	4.6	4.4	7.1	23.0
	% within Open2Experiences	4.3%	13.0%	26.1%	56.5%	100.0%
	% within Lifetime ideation or attempt	2.9%	13.0%	27.3%	37.1%	20.2%
	% of Total	0.9%	2.6%	5.3%	11.4%	20.2%
2 Open	Count	33	20	16	22	91
	Expected Count	27.1	18.4	17.6	27.9	91.0
	% within Open2Experiences	36.3%	22.0%	17.6%	24.2%	100.0%
	% within Lifetime ideation or attempt	97.1%	87.0%	72.7%	62.9%	79.8%
	% of Total	28.9%	17.5%	14.0%	19.3%	79.8%
Total	Count	34	23	22	35	114
	Expected Count	34.0	23.0	22.0	35.0	114.0
	% within Open2Experiences	29.8%	20.2%	19.3%	30.7%	100.0%
	% within Lifetime ideation or attempt	100.0%	100.0%	100.0%	100.0%	100.0%
	% of Total	29.8%	20.2%	19.3%	30.7%	100.0%

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	13.942[a]	3	.003
Likelihood Ratio	15.848	3	.001
Linear-by-Linear Association	13.768	1	.000
N of Valid Cases	114		

a. 2 cells (25.0%) have expected count less than 5. The minimum expected count is 4.44.

Conclusion:

1) As the Chi-Square statistics are significant, the Ho was rejected for total personality score, Extraversion and Neuroticism/Emotional instability.
2) It can be concluded that general personality types seem to be related to patterns of suicidality and will be tested further later on in the analysis. From the data in above tables it would seem that low scores across the five personality types suggests that people who are generally introverted, argumentative, neurotic, conventional and disorganised tend to be more at risk in terms of planning and attempting suicide.

3) As the Ho was rejected for personality (Extraversion and Neuroticism scales only) it can be concluded that both personality types seem to be related to patterns of suicidality and will be tested further later on in the analysis.
4) The Chi-Square statistics are not significant for Conscientiousness.
5) The Chi-Square was significant for Agreeable and Open2Experiences, but the findings do not seem to be amenable to meaningful interpretation. This is actually in line with some literature, which suggests that the only two personality types to matter with regards to suicidality are Extraversion and Neuroticism.

Results:
Q: Are there differences in Educational Achievement across the four suicidality groups?

Degree or higher * Lifetime ideation or attempt Crosstabulation

Degree or Higher			Lifetime ideation or attempt				
			Never	Just a brief passing thought	Had a plan at least once	Have attempted to kill myself	Total
Yes	1	Count	18	18	11	3	50
		Expected Count	14.9	10.1	9.6	15.4	50.0
		% within Degree or higher	36.0%	36.0%	22.0%	6.0%	100.0%
		% within Lifetime ideation or attempt	52.9%	78.3%	50.0%	8.6%	43.9%
		% of Total	15.8%	15.8%	9.6%	2.6%	43.9%
No	2	Count	16	5	11	32	64
		Expected Count	19.1	12.9	12.4	19.6	64.0
		% within Degree or higher	25.0%	7.8%	17.2%	50.0%	100.0%
		% within Lifetime ideation or attempt	47.1%	21.7%	50.0%	91.4%	56.1%
		% of Total	14.0%	4.4%	9.6%	28.1%	56.1%
Total		Count	34	23	22	35	114
		Expected Count	34.0	23.0	22.0	35.0	114.0
		% within Degree or higher	29.8%	20.2%	19.3%	30.7%	100.0%
		% within Lifetime ideation or attempt	100.0%	100.0%	100.0%	100.0%	100.0%
		% of Total	29.8%	20.2%	19.3%	30.7%	100.0%

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	30.231[a]	3	.000
Likelihood Ratio	34.239	3	.000
Linear-by-Linear Association	16.901	1	.000
N of Valid Cases	114		

Conclusion:

As the Ho was rejected for education (degree – Yes / No), it can be concluded that education seems to be related to patterns of suicidality. As can be seen in the Cross-tabulation table, it is the last column that seems to be forcing the significant result, as the difference between levels of education in suicide attempters is large. There appear to be nothing significant about the other differences; however, those with higher education seem to have thought about suicide more often. If education was an important causal factor we would see a stronger pattern across suicidality groups. The result may be a consequence of non-random sampling, as most of the control group were taken from a student population. There is little to suggest a significant association between education and suicidality in the literature, therefore, it was considered that this was not an important finding for the current study.

Results:
Q: Are there differences in Mental Health Difficulties across the four suicidality groups?

Depression or Bipolar * Lifetime ideation or attempt Crosstabulation

Depression or Bipolar		Lifetime ideation or attempt				Total
		Never	Just a brief passing thought	Had a plan at least once	Have attempted to kill myself	
No	Count	34	20	5	1	60
	Expected Count	17.9	12.1	11.6	18.4	60.0
	% within Depression or Bipolar	56.7%	33.3%	8.3%	1.7%	100.0%
	% within Lifetime ideation or attempt	100.0%	87.0%	22.7%	2.9%	52.6%
	% of Total	29.8%	17.5%	4.4%	0.9%	52.6%
Yes	Count	0	3	17	34	54
	Expected Count	16.1	10.9	10.4	16.6	54.0
	% within Depression or Bipolar	0.0%	5.6%	31.5%	63.0%	100.0%
	% within Lifetime ideation or attempt	0.0%	13.0%	77.3%	97.1%	47.4%
	% of Total	0.0%	2.6%	14.9%	29.8%	47.4%
Total	Count	34	23	22	35	114
	Expected Count	34.0	23.0	22.0	35.0	114.0
	% within Depression or Bipolar	29.8%	20.2%	19.3%	30.7%	100.0%
	% within Lifetime ideation or attempt	100.0%	100.0%	100.0%	100.0%	100.0%
	% of Total	29.8%	20.2%	19.3%	30.7%	100.0%

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	84.142[a]	3	.000
Likelihood Ratio	107.246	3	.000
Linear-by-Linear Association	79.028	1	.000
N of Valid Cases	114		

Conclusion:
As the Ho was rejected for depression (depression – Yes / No), it can be concluded that depression seems to be related to patterns of suicidality. This may partly be an artefact of purposive sampling. However, it is clear that Planners and Attempters have a diagnosis of depression or bipolar disorder, while Nevers and Thinkers do not. This is what is forcing the significant result.

Depression is also measured using the PHQ-9 scale, but it is intricately linked to suicidal thoughts and requires special consideration.

Therefore, overall, Gender, Age and Relationship Status do not appear to be differentiated across the four suicidality groups. Education is significant but unimportant. Alcohol and Drug problems were not picked up as a variable (most said they did not have a problem). Personality, in terms of extraversion and neuroticism, seems to be significant and perhaps important – the more introvert and more neurotic tending to have a higher risk along the suicidality continuum. This is generally in line with the findings from previous literature. Depression is a complex factor because it is closely linked to suicide and will require careful consideration during the analysis.

Question (Q) / Hypothesis (Ho):
The main dependent variable (DV) is suicidal cognitions as characterised by a Pervasive Sense of Hopelessness, and is measured using the Suicide Cognition Scale (SCS). Before any kind of parametric tests can be performed, the data-set needs to be examined to check it satisfies a range of statistical assumptions, including:

- Level of Measurement
- Psychometric rigour (reliability and validity)
- Random Sampling
- Normality
- Homogeneity
- Power Analysis
- Linearity/Multi-collinearity/Singularity

Level of Measurement: The SCS measure uses bounded response categories in the form of a Likert scale ranging from Strongly Disagree to Strongly Agree. The ordinates within such scales usually provide from 3 to 7 options with a mid-point suggesting some variant of 'neither agree or disagree', 'unsure', or 'neutral'. Following pre-tests of the scale, it was noted that the results were producing a 'response set' located around the mid-point. This may have been because it offered participants a way to avoid making a decision (or being entirely honest) in their responses to the range of sensitive issues addressed by the questions in the measure.

As a result, the decision was made to remove this option and so 'force' participants to make a choice. The relative merits of including a mid-point and how these mid-points are interpreted have a long history of debate within the methodological literature without reaching any firm conclusions (Garland, 1991). The decision to use a 4 point Likert scale produced more meaningful results in the sense that it removed the risk of a 'response set'. While this type of scale puts more pressure on participants, the change was considered as not overly detrimental and was ethically approved. Despite this change, the response categories still constitute a continuous scale, which can be used as equivalent to interval level data. This is appropriate for use with inferential statistics.

Psychometric rigour (reliability and validity): The SCS measure has been tested on a range of different sample populations and compared against a

number of established suicidal measures. In particular, it has demonstrated good reliability and validity across clinical and student adult and adolescent samples, and has been compared with measures such as the Beck Scale for Suicidal Ideation, the Suicidal Ideation Questionnaire and the SBQ-R (Gibbs, 2010; Rudd et al., 2010; Slee et al., 2008). Appendix C has further details about psychometric properties of the SCS.

Random Sampling: The aim was to obtain participants who represented maximum variability across the suicidality spectrum. As such, this study used non-probability purposive sampling (quota method) in order to ensure that the sample population included participants who represented the four key groups of suicidality, namely: those who have never contemplated suicide, those who have experienced suicidal ideations, those who have planned to kill themselves at least once, and those who have attempt to take their own lives.

In order to ensure that participants representative of each group were included in the study, both clinical and non-clinical sample populations were included in the study. The clinical group were recruited from a NHS acute day service, whilst the control group were recruited from a university setting (though some were recruited from the general population).

While it is recognised that samples should be randomly obtained in order to ensure that the results are fully generalisable to the wider population, this is often difficult to achieve in most social science research (Coon & Mitterer, 2010). As such, this may be a limitation in the findings.

Normality: It is assumed that the population from which samples are drawn is normally distributed. This can be checked in SPSS using Descriptive Statistics for TotalSCS across the whole sample.

Descriptives

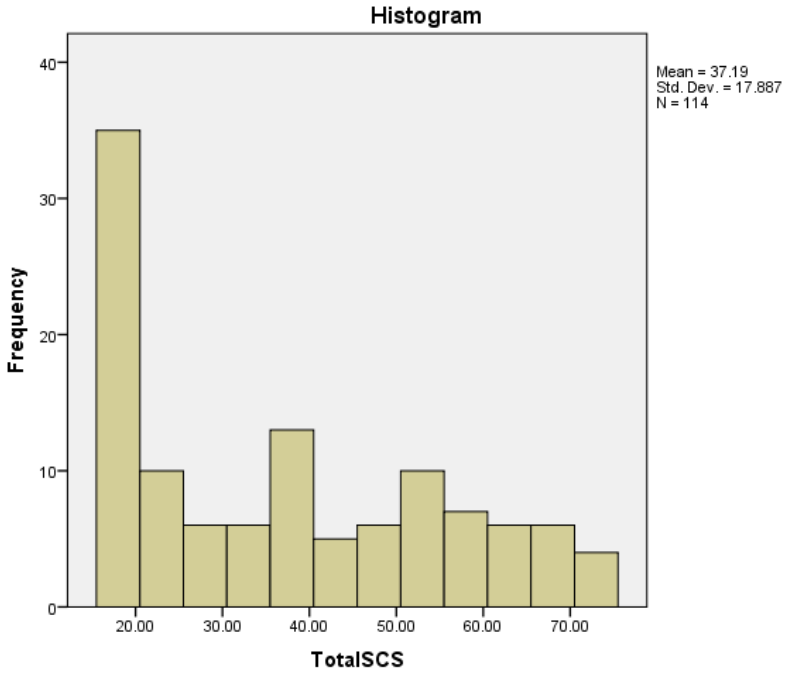
			Statistic	Std. Error
TotalSCS	Mean		37.1930	1.67532
	95% Confidence Interval for Mean	Lower Bound	33.8739	
		Upper Bound	40.5121	
	5% Trimmed Mean		36.3918	
	Median		35.0000	
	Variance		319.962	
	Std. Deviation		17.88749	
	Minimum		18.00	
	Maximum		72.00	
	Range		54.00	
	Interquartile Range		34.25	
	Skewness		.454	.226
	Kurtosis		-1.211	.449

Tests of Normality

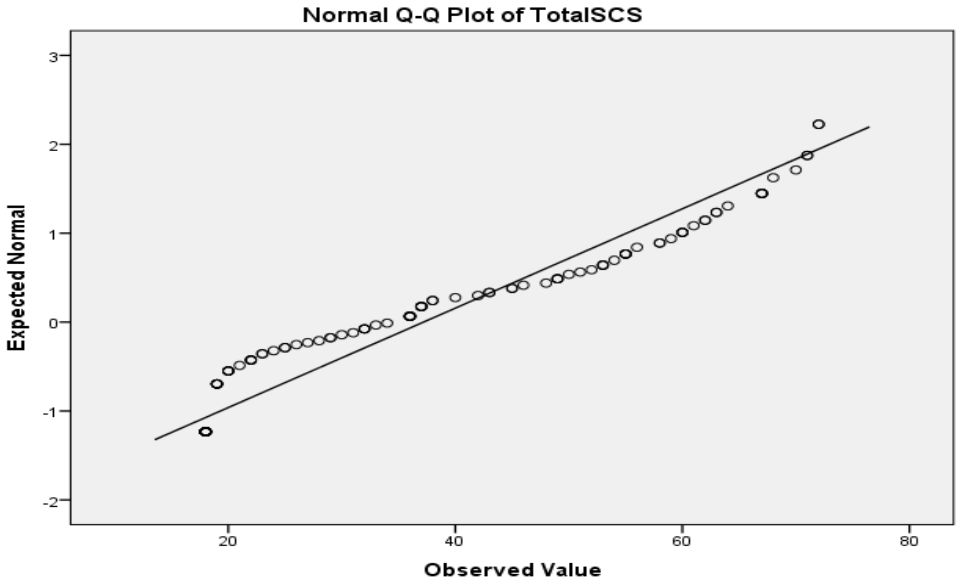
	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
TotalSCS	.155	114	.000	.879	114	.000

a. Lilliefors Significance Correction

The test for normality is significant which suggests that the data from this variable are not normally distributed. However, the Skewness of the distribution is <1 which suggests the distribution is not too far off a normal distribution. This is evidenced by the Q-Q Plot which shows that the data are located reasonably close to the normal distribution regression line. The Histogram indicates that low SCS scores in some of the suicidality groups may be causing a problem.



The Q-Q Plot below is more helpful and suggests that many of the scores are near the regression line.



Looking at the normal distribution of the SCS data across the suicidality groups, it can be observed that the Never group is the only one that is not normally distributed with a Skewness value > 1 at 2.069. This is evident in the test of normality below. Here only the Never group reach significance at <0.001.

Descriptives

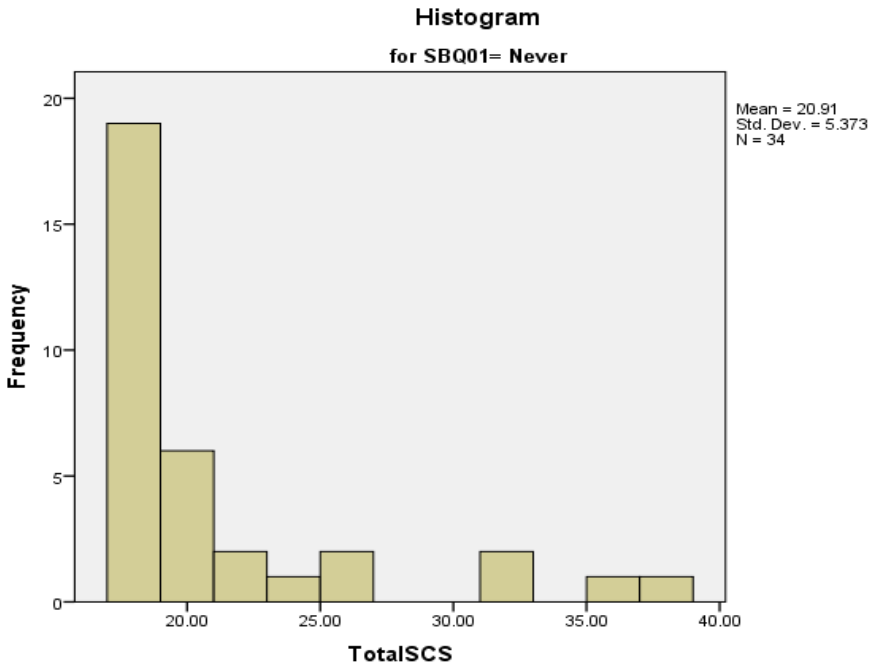
	Lifetime ideation or attempt			Statistic	Std. Error
TotalSCS	Never	Mean		20.9118	.92149
		95% Confidence Interval for Mean	Lower Bound	19.0370	
			Upper Bound	22.7865	
		5% Trimmed Mean		20.2026	
		Median		18.0000	
		Variance		28.871	
		Std. Deviation		5.37315	
		Minimum		18.00	
		Maximum		37.00	
		Range		19.00	
		Interquartile Range		4.00	
		Skewness		2.069	.403
		Kurtosis		3.295	.788
	Just a brief passing thought	Mean		26.8261	1.74303
		95% Confidence Interval for Mean	Lower Bound	23.2113	
			Upper Bound	30.4409	
		5% Trimmed Mean		26.1715	
		Median		23.0000	
		Variance		69.877	
		Std. Deviation		8.35927	
		Minimum		18.00	
		Maximum		49.00	
		Range		31.00	
		Interquartile Range		13.00	
		Skewness		.879	.481
		Kurtosis		.348	.935

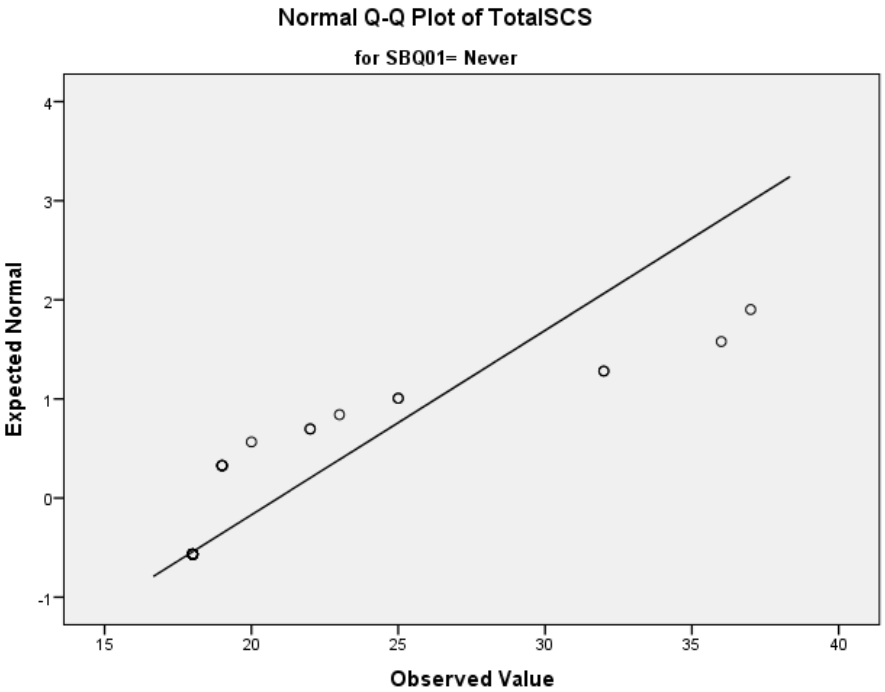
	Had a plan at least once	Mean		44.2727	3.07777
		95% Confidence Interval for Mean	Lower Bound	37.8722	
			Upper Bound	50.6733	
		5% Trimmed Mean		44.2172	
		Median		44.0000	
		Variance		208.398	
		Std. Deviation		14.43601	
		Minimum		18.00	
		Maximum		72.00	
		Range		54.00	
		Interquartile Range		16.75	
		Skewness		-.082	.491
		Kurtosis		-.291	.953
	Have attempted to kill myself	Mean		55.3714	2.07753
		95% Confidence Interval for Mean	Lower Bound	51.1494	
			Upper Bound	59.5935	
		5% Trimmed Mean		56.0952	
		Median		58.0000	
		Variance		151.064	
		Std. Deviation		12.29080	
		Minimum		24.00	
		Maximum		72.00	
		Range		48.00	
		Interquartile Range		15.00	
		Skewness		-.867	.398
		Kurtosis		.239	.778

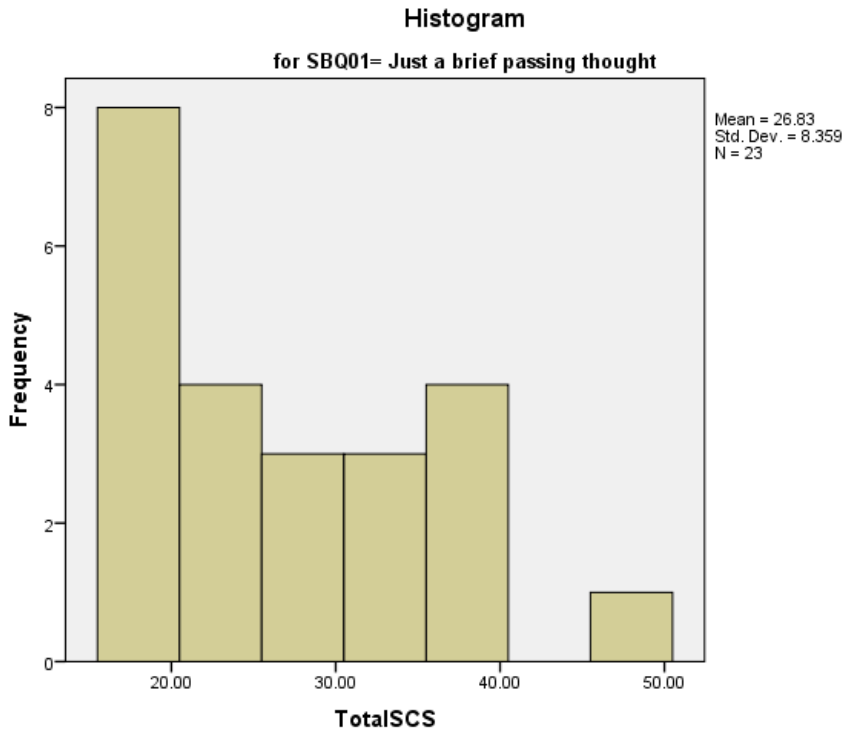
Tests of Normality

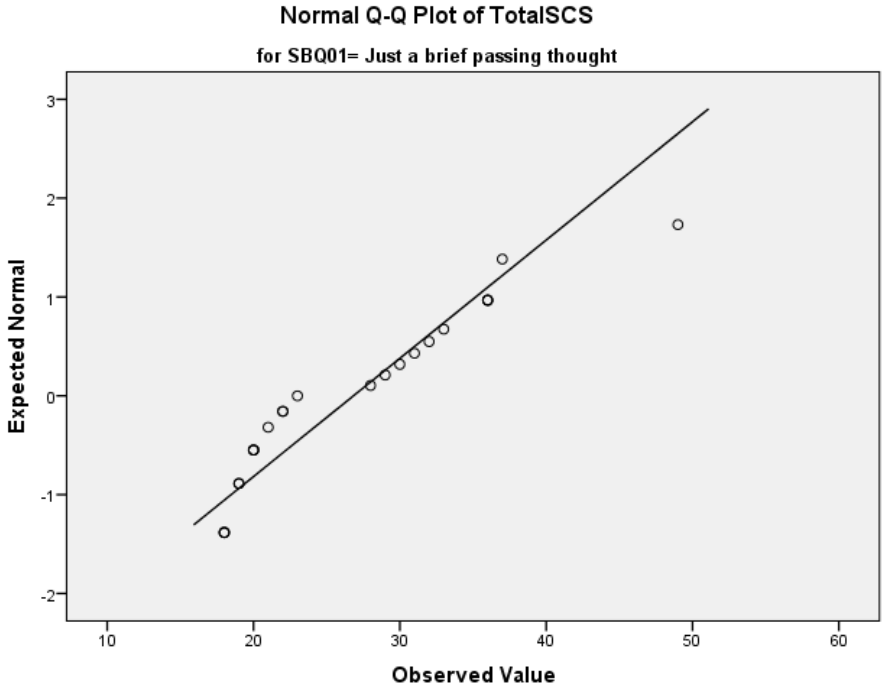
	Lifetime ideation or attempt	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
		Statistic	df	Sig.	Statistic	df	Sig.
TotalSCS	Never	.345	34	.000	.609	34	.000
	Just a brief passing thought	.198	23	.052	.880	23	.051
	Had a plan at least once	.101	22	.200*	.978	22	.883
	Have attempted to kill myself	.117	35	.200*	.932	35	.032

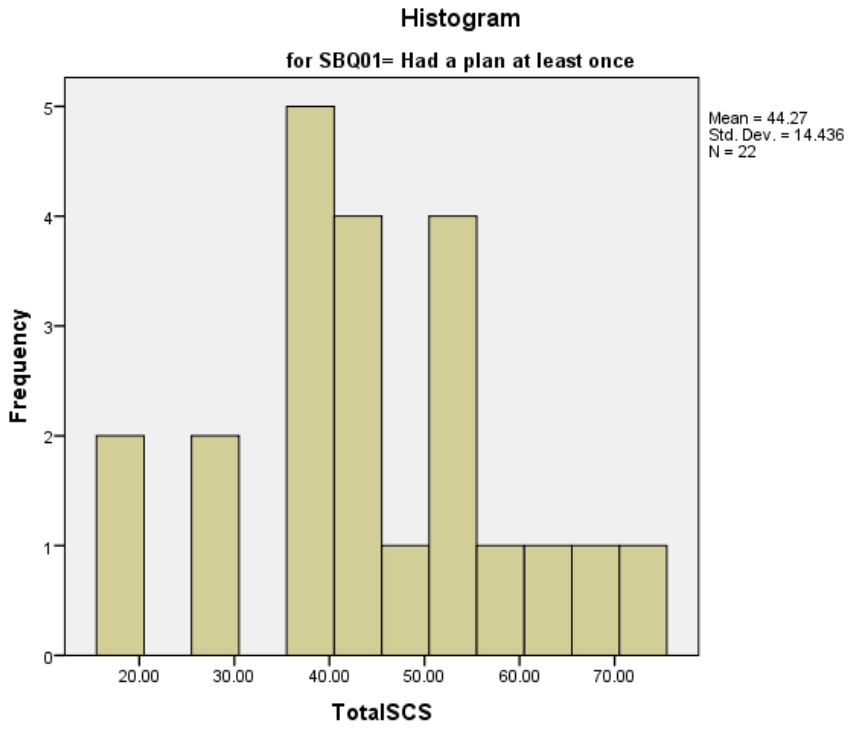
The histograms and Q-Q plots are below. They rarely look normally distributed due to small numbers.

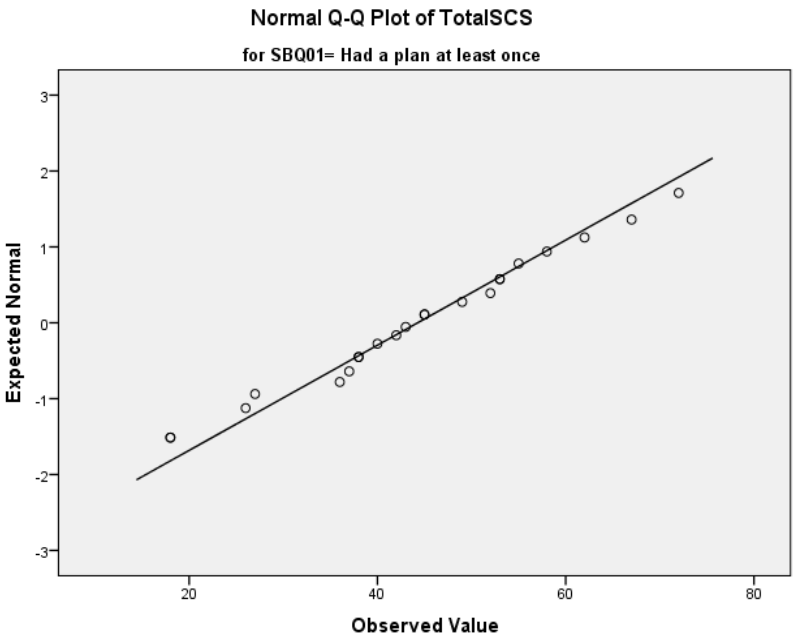


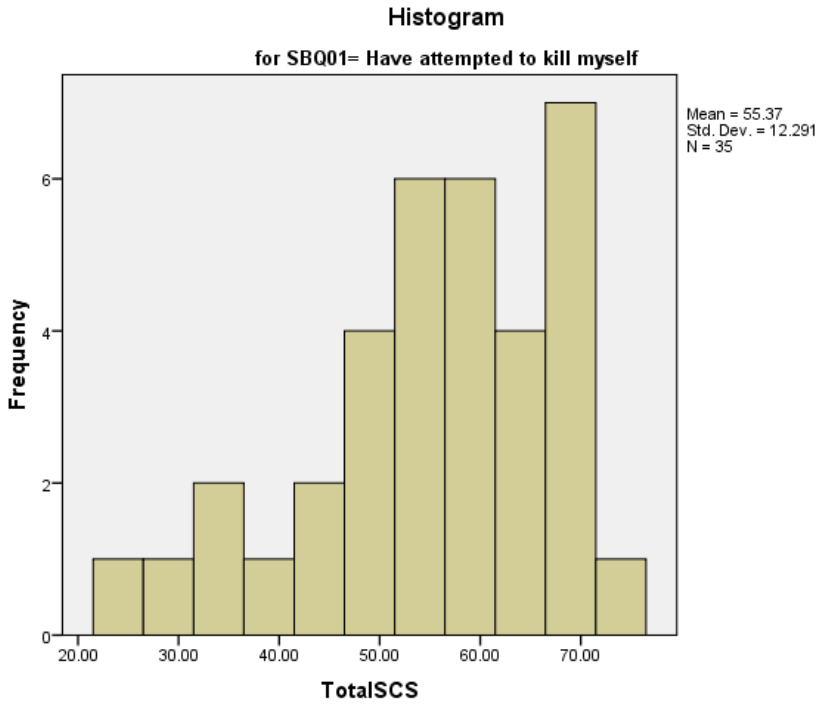


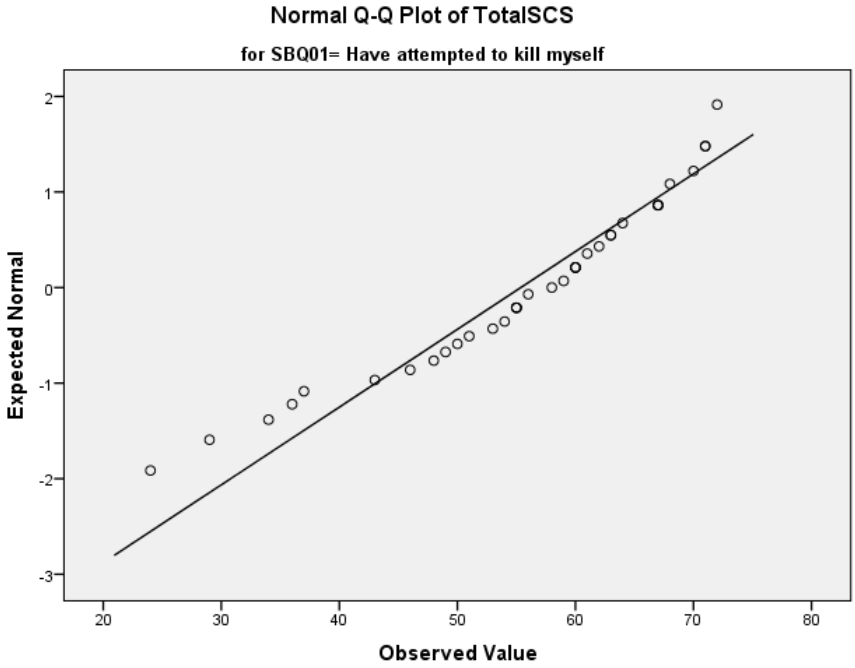

Histogram
for SBQ01= Just a brief passing thought
Mean = 26.83
Std. Dev. = 8.359
N = 23
Frequency
TotalSCS
0
2
4
6
8
20.00
30.00
40.00
50.00


Normal Q-Q Plot of TotalSCS
for SBQ01= Just a brief passing thought
Expected Normal
Observed Value
-2
-1
0
1
2
3
10
20
30
40
50
60


Histogram
for SBQ01= Had a plan at least once
Mean = 44.27
Std. Dev. = 14.436
N = 22
Frequency
TotalSCS
0
1
2
3
4
5
20.00
30.00
40.00
50.00
60.00
70.00


Normal Q-Q Plot of TotalSCS
for SBQ01= Had a plan at least once
Expected Normal
Observed Value
-3
-2
-1
0
1
2
3
20
40
60
80





Often in psychological research, scores on the dependent variable are rarely nicely normally distributed. For example, there is not a normal distribution for anxiety or depression as most people tend not to be anxious or depressed.

Most of the statistical tests are reasonably robust and can tolerate violations of this assumption. With large enough samples (30+), no problems in calculating a meaningful statistic should be experienced; particularly as SPSS now has a built-in function to prevent running analyses which are illogical or which strongly violate statistical assumptions.

Homogeneity of Variance: The variance WITHIN groups should be equal in order to ensure a meaningful analysis. Under ANOVA and MANOVA this is examined using the Levene Test. Again, if this rule is violated a test statistic can still be produced provided that the groups have broadly similar *n* values. There are also optional statistics of difference that can be used in order to check findings (see ANOVA output).

Power Analysis: To limit the possibility of making a Type I (incorrectly rejecting a null hypothesis) or a Type II (failing to reject a false null hypothesis) error, a power analysis was undertaken. This is a series of logical decisions regarding what statistic to use and under what conditions, including: sample size, normality of sample distribution, homogeneity of variance, and level of statistical significance (alpha level) to accept (e.g., $p < 0.05$ or $p < 0.01$).

In terms of sample size, power is usually not an issue when $n > 100$ and group sizes are $n > 20$. In the current study, $n = 114$ and group sizes are greater than 20.

Regardless, throughout Appendix R, samples for each statistic have been commented on. For factor analysis, Bartlett's test and KMO measure showed the sample was valid. Across analyses were the sample was sufficient, alpha level was adjusted to $p < 0.01$ in most cases. This made it more difficult to reject the null hypothesis, and therefore, avoided obtaining random significant scores; as can be common with sufficient sample sizes. Normal distributions across the four suicidality groups were also tested. Where there were issues with homogeneity of variance, these were commented on. In the ANOVA test, a stricter statistic was used, again limiting the potential for error. Variables were excluded from some analyses on the grounds of multicollinearity, for example, depression from the Logistic Regression.

Combined, this helps to improve the power, or accuracy, of the statistics run on the data collected.

Multicollinearity: This occurs when two or more predictor variables in a multiple regression model are highly correlated, potentially confounding the results (Disatnik & Sivan, 2016). Multicollinearity can suggest that the highly correlated variables are measuring the same thing due to their overlap. For example, depression is a powerful predictor of suicidality, and demonstrates multicollinearity with SCS scores. Due to the problem of multicollinearity, it was not possible to meaningfully introduce depression as a predictor variable in the model.

Conclusion:
It would appear that the data-set generally satisfies all the assumptions which need to be met in order to be able to legitimately use inferential statistics.

Question (Q) / Hypothesis (Ho):
From the SCS scores, a new variable can be created: TotalSCS (the total score from all 18 items of the scale). This new variable can then be used in the

analysis. However, factor analysis will allow for examining the pattern of factors that may emerge from the scale.

Before going ahead with a factor analysis there are two issues to consider. Namely, that the data are suitable for factor analysis in terms of 1) sample size and 2) strength of the relationship amongst items/variables (collinearity).

Sample size is usually interpreted in terms of the ratio of subjects to items and it is generally suggested that for factor analysis to operate as a sufficiently powerful statistic, there should exist a 5 to 1 ratio – 5 participants to 1 variable (5 x 18 = 90; *n* in the current study = 114).

An inspection of the correlation coefficient matrices for the 18 variables should show coefficient values above 0.3. However, the problem this data-set is likely to have is that of multicollinearity. In such situations, it is advisable to either exclude the variables, which theoretically may not be logical (as in this case, when the variables are part of a scale); or to combine the variables to create a more complete new variable (which is what was done: TotalSCS).

Two statistics that are helpful in factor analysis are the Bartlett's test of sphericity which is always produced in the output. This value should always be significant. Another test is the KMO value and this should range between zero and one and should approach one. If both tests are satisfied, then factor analysis meets the two conditions of sample size and collinearity.

Research Question: Does there exist a specific suicidal belief system (as measured by the SCS)? To answer this, the underlying factor structure of the SCS scale must be examined. Past research suggests a two or three factor structure: Unbearable; Unsolvable; Unlovable.

Type of Analysis: In order to answer this question, we need to conduct **Principal Axis Factoring.**

Results:

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.960
Bartlett's Test of Sphericity	Approx. Chi-Square	3524.299
	df	153
	Sig.	.000

Total Variance Explained

Factor	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	15.035	83.529	83.529	14.908	82.823	82.823	6.604	36.689	36.689
2	.586	3.254	86.783	.488	2.713	85.536	5.294	29.410	66.099
3	.387	2.148	88.931	.245	1.361	86.897	3.744	20.798	86.897
4	.316	1.755	90.687						
5	.302	1.678	92.365						
6	.248	1.380	93.745						
7	.214	1.190	94.934						
8	.176	.977	95.911						
9	.156	.864	96.775						
10	.110	.611	97.387						
11	.097	.539	97.926						
12	.085	.471	98.396						
13	.077	.430	98.826						
14	.056	.314	99.140						
15	.049	.275	99.415						
16	.041	.227	99.642						
17	.037	.206	99.848						
18	.027	.152	100.000						

Rotated Factor Matrixa

	Factor		
	Unbearable	Unsolvable	Unlovable
Getting Upset is Unbearable	.805	.404	.340
Can't Tolerate Being Upset	.780	.475	.341
Can't Cope With My Problems	.753	.487	.351
Can't Stand Pain	.747	.459	.377
Can't Withstand Pain	.711	.419	.386
Can't Describe How Bad I Feel	.705	.370	.453
Suicide Is Only Way	.469	.778	.332
Suicide Only Way To End Pain	.451	.760	.383
Rather Die	.499	.758	.328
Don't Deserve To Live	.422	.705	.505
Nothing Can Help	.502	.521	.489
Nobody Can Help Me	.501	.486	.486
Nothing Good About Me	.557	.415	.632
Nobody As Loathsome As Me	.421	.576	.590
Never Been Successful	.423	.476	.565
Better Off Without Me	.566	.494	.560
Can Never Be Forgiven	.506	.496	.511
I Am Unworthy	.593	.424	.558

Extraction Method: Principal Axis Factoring.
Rotation Method: Varimax with Kaiser Normalization.
a. Rotation converged in 7 iterations.

The highlighted coefficients are the highest across each factor and collectively they reflect the three principal factors found in other studies: Unbearable,

Unsolvable and Unlovable. As can be observed above, most of the variance lies with the first factor Unbearable.

Conclusion:
Extraction Method: Principal Axis Factoring. Three factors were forced rather than reflecting Eigenvalues of at least 1.00. As seen above, the first factor accounts for 83.5% of the variance and the other two only about 6% of the variance. Therefore, although a three factor model similar to that drawn out in other studies seems to be reflected in the data, the variance balance seems to reflect a single factor model. However, the three factor model was extracted from the whole sample, suggesting that it may be a trait present in everyone, but its intensity increases under certain conditions.

Question (Q) / Hypothesis (Ho):
Three factors have been extracted which account for approximately 85% of the variance; however, most of this variance is located in the first factor, Unbearable. Thus, the factor analysis revealed the cognitive pattern underlying suicide, defined around the three factors.

The present study then took each participant's total score for the SCS scale (knowing that it is organised around three cognitive factors) and used this as the basis for further tests.

First, SCS scores were examined for mean differences between the four suicidality groups. This intends to confirm that the SCS is tapping into a particular cognitive pattern under different suicidal cognitions.

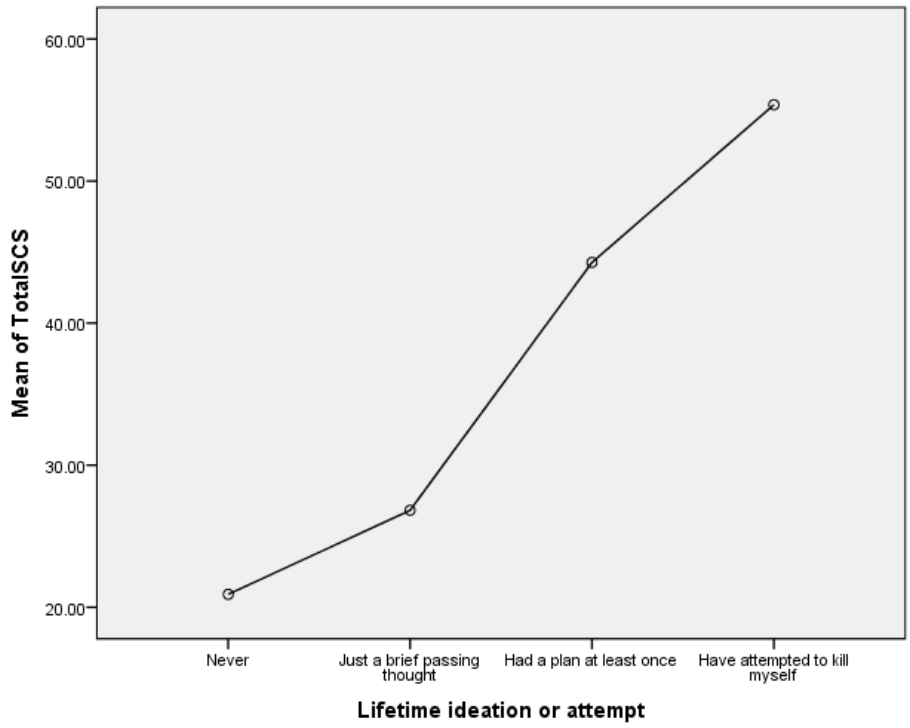
Therefore, an independent Group Design (between groups) One-way ANOVA was used, involving one IV (group variable) with three or more levels (SBQ01) and one DV continuous variable, namely: TotalSCS.

SBQ01 is a categorical/nominal variable, with four groups (Never, Thinkers, Planners, Attempters). TotalSCS is a continuous variable, and scores can range from 18 to 72 (across 4-point Likert scale).

Research Question: Does the suicidal belief system differ across levels of suicidality; therefore, is there a difference in SCS scores across groups? The Ho would be that there is NO difference in SCS scores across the four levels of suicidality.

Type of Analysis: Independent Group Design (between Groups) One-way ANOVA will show whether there are significant differences in mean scores on the DV (TotalSCS) across the four groups of the IV. **Post-hoc tests** will be used to find out where any differences lie.

Results:



Descriptives

TotalSCS

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
Never	34	20.9118	5.37315	.92149	19.0370	22.7865	18.00	37.00
Just a brief passing thought	23	26.8261	8.35927	1.74303	23.2113	30.4409	18.00	49.00
Had a plan at least once	22	44.2727	14.43601	3.07777	37.8722	50.6733	18.00	72.00
Have attempted to kill myself	35	55.3714	12.29080	2.07753	51.1494	59.5935	24.00	72.00
Total	114	37.1930	17.88749	1.67532	33.8739	40.5121	18.00	72.00

Looking at the mean scores across the groups and the mean plot line graph it would appear that there are significant differences between the groups in terms of their suicidal cognition scores.

Test of Homogeneity of Variances

TotalSCS

Levene Statistic	df1	df2	Sig.
7.641	3	110	.000

Before looking at the statistical significance of these differences, it is important to acknowledge that the data do not satisfy the homogeneity assumption. This is evidenced by the significant Levene statistic which forces the rejection of the Ho, (i.e., that there is equal variance between groups). This is not too problematic as ANOVA is robust. But in order to improve the power of the

statistic, the Dunnett T3 significance test (which takes account of the fact that the homogeneity assumption has not been met) will be used, and alpha will be set at a tougher level (0.01).

ANOVA

TotalSCS

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	24153.180	3	8051.060	73.786	.000
Within Groups	12002.575	110	109.114		
Total	36155.754	113			

Results show observed mean differences between the four suicidality groups that are significant at $p < 0.001$. The post-hoc Dunnett T3 test will reveal where these differences might lie.

Multiple Comparisons

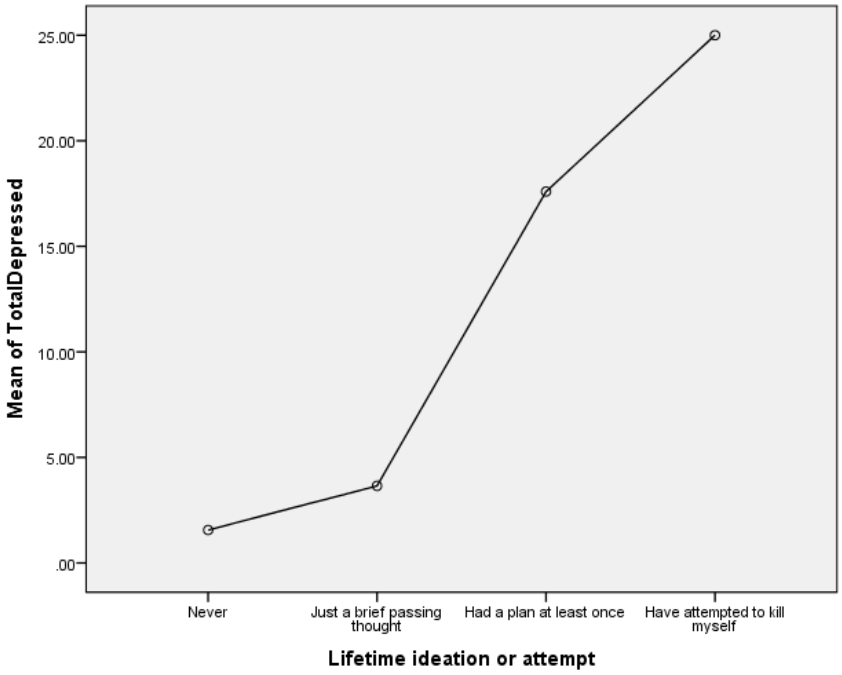
Dependent Variable: TotalSCS

	(I) Lifetime ideation or attempt	(J) Lifetime ideation or attempt	Mean Difference (I-J)	Std. Error	Sig.	99% Confidence Interval	
						Lower Bound	Upper Bound
Tukey HSD	Never	Just a brief passing thought	-5.91432	2.82017	.160	-14.8995	3.0709
		Had a plan at least once	-23.36096*	2.85814	.000	-32.4672	-14.2548
		Have attempted to kill myself	-34.45966*	2.51531	.000	-42.4736	-26.4458
	Just a brief passing thought	Never	5.91432	2.82017	.160	-3.0709	14.8995
		Had a plan at least once	-17.44664*	3.11510	.000	-27.3715	-7.5218
		Have attempted to kill myself	-28.54534*	2.80386	.000	-37.4786	-19.6121
	Had a plan at least once	Never	23.36096*	2.85814	.000	14.2548	32.4672
		Just a brief passing thought	17.44664*	3.11510	.000	7.5218	27.3715
		Have attempted to kill myself	-11.09870*	2.84206	.001	-20.1536	-2.0438
	Have attempted to kill myself	Never	34.45966*	2.51531	.000	26.4458	42.4736
		Just a brief passing thought	28.54534*	2.80386	.000	19.6121	37.4786
		Had a plan at least once	11.09870*	2.84206	.001	2.0438	20.1536
Scheffe	Never	Just a brief passing thought	-5.91432	2.82017	.228	-15.6406	3.8119
		Had a plan at least once	-23.36096*	2.85814	.000	-33.2182	-13.5037
		Have attempted to kill myself	-34.45966*	2.51531	.000	-43.1345	-25.7848
	Just a brief passing thought	Never	5.91432	2.82017	.228	-3.8119	15.6406
		Had a plan at least once	-17.44664*	3.11510	.000	-28.1900	-6.7032
		Have attempted to kill myself	-28.54534*	2.80386	.000	-38.2154	-18.8753
	Had a plan at least once	Never	23.36096*	2.85814	.000	13.5037	33.2182
		Just a brief passing thought	17.44664*	3.11510	.000	6.7032	28.1900
		Have attempted to kill myself	-11.09870*	2.84206	.002	-20.9004	-1.2970
	Have attempted to kill myself	Never	34.45966*	2.51531	.000	25.7848	43.1345
		Just a brief passing thought	28.54534*	2.80386	.000	18.8753	38.2154
		Had a plan at least once	11.09870*	2.84206	.002	1.2970	20.9004
Tamhane	Never	Just a brief passing thought	-5.91432	1.97162	.030	-12.6406	.8120
		Had a plan at least once	-23.36096*	3.21275	.000	-34.6845	-12.0375
		Have attempted to kill myself	-34.45966*	2.27272	.000	-42.0400	-26.8794
	Just a brief passing thought	Never	5.91432	1.97162	.030	-.8120	12.6406
		Had a plan at least once	-17.44664*	3.53706	.000	-29.5405	-5.3528
		Have attempted to kill myself	-28.54534*	2.71187	.000	-37.5017	-19.5890
	Had a plan at least once	Never	23.36096*	3.21275	.000	12.0375	34.6845
		Just a brief passing thought	17.44664*	3.53706	.000	5.3528	29.5405
		Have attempted to kill myself	-11.09870	3.71332	.028	-23.6266	1.4292
	Have attempted to kill myself	Never	34.45966*	2.27272	.000	26.8794	42.0400
		Just a brief passing thought	28.54534*	2.71187	.000	19.5890	37.5017
		Had a plan at least once	11.09870	3.71332	.028	-1.4292	23.6266
Dunnett T3	Never	Just a brief passing thought	-5.91432	1.97162	.029	-12.6322	.8036
		Had a plan at least once	-23.36096*	3.21275	.000	-34.6604	-12.0615
		Have attempted to kill myself	-34.45966*	2.27272	.000	-42.0340	-26.8853
	Just a brief passing thought	Never	5.91432	1.97162	.029	-.8036	12.6322
		Had a plan at least once	-17.44664*	3.53706	.000	-29.5247	-5.3686
		Have attempted to kill myself	-28.54534*	2.71187	.000	-37.4963	-19.5944
	Had a plan at least once	Never	23.36096*	3.21275	.000	12.0615	34.6604
		Just a brief passing thought	17.44664*	3.53706	.000	5.3686	29.5247
		Have attempted to kill myself	-11.09870	3.71332	.028	-23.6140	1.4166
	Have attempted to kill myself	Never	34.45966*	2.27272	.000	26.8853	42.0340
		Just a brief passing thought	28.54534*	2.71187	.000	19.5944	37.4963
		Had a plan at least once	11.09870	3.71332	.028	-1.4166	23.6140

*. The mean difference is significant at the 0.01 level.

Conclusion:
Though a lot of data is produced in the table above, the top two statistics (Tukey HSD and Scheffe) are only useful if the homogeneity assumption is met, which is not the case here. Therefore, the bottom two, especially the Dunnett T3 test, are relevant. The findings show that all four groups differ significantly from each other in terms of the degree of suicidal cognitions held. As participants' level of suicidality changes from Never to Thinkers, Planners and Attempters, a significant increase in their suicidal cognitions can be observed. The difference between Never and Thinkers groups is smaller but still evident, suggesting that changes in an individual's suicidal belief system are associated with emerging thoughts about killing oneself.

Question (Q) / Hypothesis (Ho):
Depression is another variable often positively associated with suicide. To test whether this is also evident in this data, a one-way ANOVA using Total-Depression scores can be used.



Descriptives

TotalDepressed

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
Never	34	1.5588	2.04778	.35119	.8443	2.2733	.00	10.00
Just a brief passing thought	23	3.6522	3.70023	.77155	2.0521	5.2523	.00	16.00
Had a plan at least once	22	17.5909	8.81373	1.87909	13.6831	21.4987	3.00	30.00
Have attempted to kill myself	35	25.0000	6.99159	1.18179	22.5983	27.4017	3.00	30.00
Total	114	12.2719	11.76336	1.10174	10.0892	14.4547	.00	30.00

The mean scores across the groups and the mean plot line graph suggest that there are major differences between the groups in terms of their total depression scores. However, the difference between the Never and Thinkers groups is actually very small.

Test of Homogeneity of Variances

TotalDepressed

Levene Statistic	df1	df2	Sig.
14.675	3	110	.000

Before looking at the statistical significance of these differences, it is important to acknowledge that the data do not satisfy the homogeneity assumption. This is evidenced by the significant Levene statistic which forces the rejection of the Ho, (i.e., that there is equal variance between groups). This is not too problematic as ANOVA is robust. But in order to improve the power of the statistic, the Dunnett T3 significance test (which takes account of the fact that the homogeneity assumption has not been met) will be used, and alpha will be set at a tougher level (0.01).

Multiple Comparisons

Dependent Variable: TotalDepressed

	(I) Lifetime ideation or attempt	(J) Lifetime ideation or attempt	Mean Difference (I-J)	Std. Error	Sig.	99% Confidence Interval	
						Lower Bound	Upper Bound
Tukey HSD	Never	Just a brief passing thought	-2.09335	1.57276	.545	-7.1042	2.9175
		Had a plan at least once	-16.03209*	1.59394	.000	-21.1104	-10.9537
		Have attempted to kill myself	-23.44118*	1.40275	.000	-27.9104	-18.9720
	Just a brief passing thought	Never	2.09335	1.57276	.545	-2.9175	7.1042
		Had a plan at least once	-13.93874*	1.73724	.000	-19.4737	-8.4038
		Have attempted to kill myself	-21.34783*	1.56367	.000	-26.3297	-16.3659
	Had a plan at least once	Never	16.03209*	1.59394	.000	10.9537	21.1104
		Just a brief passing thought	13.93874*	1.73724	.000	8.4038	19.4737
		Have attempted to kill myself	-7.40909*	1.58497	.000	-12.4589	-2.3593
	Have attempted to kill myself	Never	23.44118*	1.40275	.000	18.9720	27.9104
		Just a brief passing thought	21.34783*	1.56367	.000	16.3659	26.3297
		Had a plan at least once	7.40909*	1.58497	.000	2.3593	12.4589
Scheffe	Never	Just a brief passing thought	-2.09335	1.57276	.622	-7.5175	3.3308
		Had a plan at least once	-16.03209*	1.59394	.000	-21.5293	-10.5349
		Have attempted to kill myself	-23.44118*	1.40275	.000	-28.2790	-18.6034
	Just a brief passing thought	Never	2.09335	1.57276	.622	-3.3308	7.5175
		Had a plan at least once	-13.93874*	1.73724	.000	-19.9301	-7.9473
		Have attempted to kill myself	-21.34783*	1.56367	.000	-26.7406	-15.9550
	Had a plan at least once	Never	16.03209*	1.59394	.000	10.5349	21.5293
		Just a brief passing thought	13.93874*	1.73724	.000	7.9473	19.9301
		Have attempted to kill myself	-7.40909*	1.58497	.000	-12.8753	-1.9428
	Have attempted to kill myself	Never	23.44118*	1.40275	.000	18.6034	28.2790
		Just a brief passing thought	21.34783*	1.56367	.000	15.9550	26.7406
		Had a plan at least once	7.40909*	1.58497	.000	1.9428	12.8753
Tamhane	Never	Just a brief passing thought	-2.09335	.84772	.110	-5.0097	.8230
		Had a plan at least once	-16.03209*	1.91163	.000	-22.8543	-9.2099
		Have attempted to kill myself	-23.44118*	1.23287	.000	-27.5967	-19.2856
	Just a brief passing thought	Never	2.09335	.84772	.110	-.8230	5.0097
		Had a plan at least once	-13.93874*	2.03133	.000	-21.0037	-6.8737
		Have attempted to kill myself	-21.34783*	1.41136	.000	-26.0174	-16.6783
	Had a plan at least once	Never	16.03209*	1.91163	.000	9.2099	22.8543
		Just a brief passing thought	13.93874*	2.03133	.000	6.8737	21.0037
		Have attempted to kill myself	-7.40909	2.21983	.011	-14.9298	.1116
	Have attempted to kill myself	Never	23.44118*	1.23287	.000	19.2856	27.5967
		Just a brief passing thought	21.34783*	1.41136	.000	16.6783	26.0174
		Had a plan at least once	7.40909	2.21983	.011	-.1116	14.9298
Dunnett T3	Never	Just a brief passing thought	-2.09335	.84772	.106	-5.0054	.8187
		Had a plan at least once	-16.03209*	1.91163	.000	-22.8371	-9.2270
		Have attempted to kill myself	-23.44118*	1.23287	.000	-27.5926	-19.2897
	Just a brief passing thought	Never	2.09335	.84772	.106	-.8187	5.0054
		Had a plan at least once	-13.93874*	2.03133	.000	-20.9914	-6.8860
		Have attempted to kill myself	-21.34783*	1.41136	.000	-26.0144	-16.6812
	Had a plan at least once	Never	16.03209*	1.91163	.000	9.2270	22.8371
		Just a brief passing thought	13.93874*	2.03133	.000	6.8860	20.9914
		Have attempted to kill myself	-7.40909	2.21983	.011	-14.9216	.1034
	Have attempted to kill myself	Never	23.44118*	1.23287	.000	19.2897	27.5926
		Just a brief passing thought	21.34783*	1.41136	.000	16.6812	26.0144
		Had a plan at least once	7.40909	2.21983	.011	-.1034	14.9216

*. The mean difference is significant at the 0.01 level.

Conclusion:

The Dunnett T3 test findings show that all groups differ significantly between each other in term of levels of depression, except the Never and Thinker groups. Between Planners and Attempters there is no significance but this can be accepted as it is 0.011 and alpha level was set at 0.010.

Hence, levels of suicidal cognitions seem to increase across groups or as individuals become more suicidal. Levels of depression follow a similar pattern, but only seem to increase dramatically between the thinking (ideation) and planning stages. This is evident from the line graph above.

Question (Q) / Hypothesis (Ho):
The next logical question is: what is the inter-relationship between levels of suicidal cognitions and levels of depression across each of the suicidality groups? The interaction effects (if any) between the two IVs – Suicidality Groups (SBQ01) and Depression are of interest.

A non-significant result would suggest that levels of suicidal cognitions BY group follows the same incremental pattern independent of depression; that the two variables: cognition and affect (depression) operate (increase or decrease) separately from each other.

A significant result would suggest that levels of depression influence patterns of suicidal cognitions in some way across the suicidality groups (or vice versa, cognitions influence depression).

Type of Analysis: Independent Group Design (between Groups) Two-way ANOVA will be used to look for significant differences in mean scores on the DV (SCS) across the four groups of the IV while controlling for levels of depression. **Post-hoc tests** will be used to find out where any differences lie. To perform this analysis, the depression variable will need to be converted into a nominal variable, which is called Depression3Groups. These groupings are: no depression (0-8); mild depression (9-26); and severe depression (27-36).

Results:

Levene's Test of Equality of Error Variances[a]
Dependent Variable: TotalSCS

F	df1	df2	Sig.
2.349	9	104	.019

Tests the null hypothesis that the error variance of the dependent variable is equal across groups.
a. Design: Intercept + Depress3Grps + SBQ01 + Depress3Grps * SBQ01

Before looking at the statistical significance of these differences, it is acknowledged that the data do satisfy the homogeneity assumption. The Levene's test is not significant at 0.01 and so a Ho of no difference in between group variances is retained.

Descriptive Statistics

Dependent Variable: TotalSCS

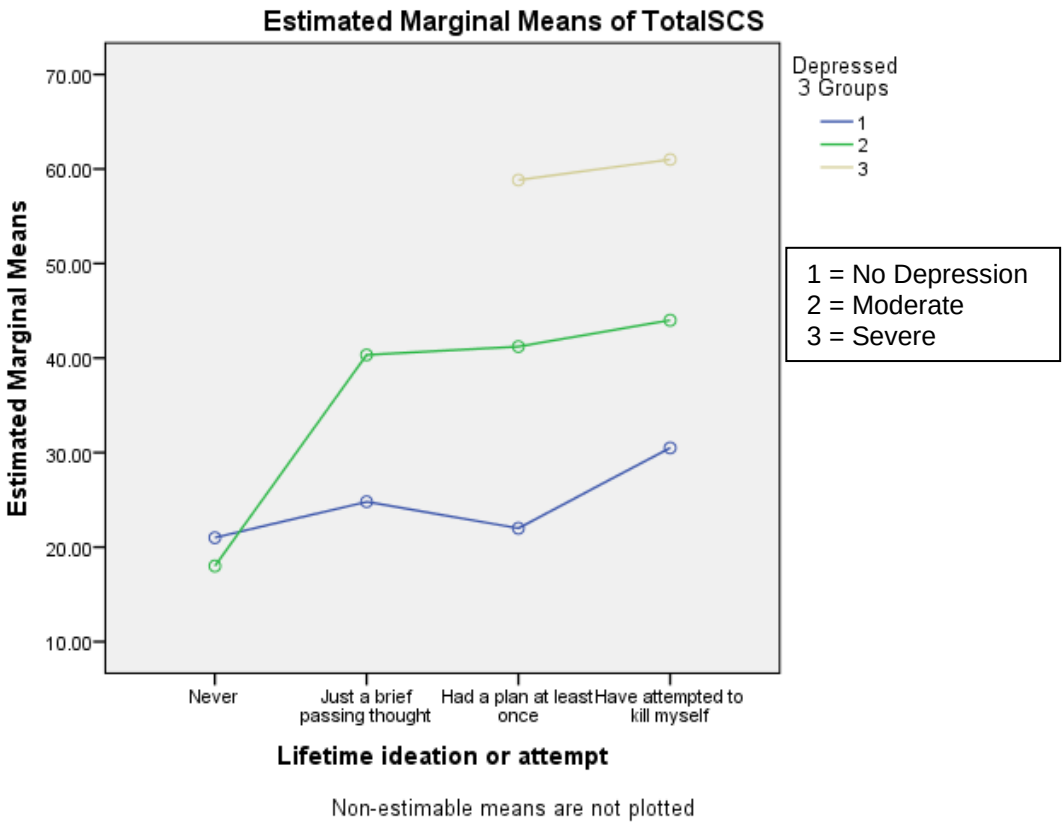
Depressed 3 Groups	Lifetime ideation or attempt	Mean	Std. Deviation	N
1 No Depression	Never	21.0000	5.43139	33
	Just a brief passing thought	24.8000	6.46936	20
	Had a plan at least once	22.0000	5.65685	2
	Have attempted to kill myself	30.5000	9.19239	2
	Total	22.7018	6.21336	57
2 Mild Depression	Never	18.0000	.	1
	Just a brief passing thought	40.3333	7.50555	3
	Had a plan at least once	42.3333	10.79462	15
	Have attempted to kill myself	45.6000	9.59398	10
	Total	42.4138	10.82826	29
3 Severe Depression	Had a plan at least once	59.0000	12.04159	5
	Have attempted to kill myself	61.7826	7.02564	23
	Total	61.2857	7.92958	28
Total	Never	20.9118	5.37315	34
	Just a brief passing thought	26.8261	8.35927	23
	Had a plan at least once	44.2727	14.43601	22
	Have attempted to kill myself	55.3714	12.29080	35
	Total	37.1930	17.88749	114

Tests of Between-Subjects Effects

Dependent Variable: TotalSCS

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	30061.741[a]	9	3340.193	57.004	.000	.831
Intercept	51842.406	1	51842.406	884.739	.000	.895
Depress3Grps	4810.738	2	2405.369	41.050	.000	.441
SBQ01	885.395	3	295.132	5.037	.003	.127
Depress3Grps * SBQ01	362.250	4	90.563	1.546	.195	.056
Error	6094.013	104	58.596			
Total	193854.000	114				
Corrected Total	36155.754	113				

a. R Squared = .831 (Adjusted R Squared = .817)



Conclusion:
While both the main effects of SCS and Depression are significant (demonstrated above with one-way ANOVA), the interact effect is not significant. This suggests that levels of depression do not directly interfere with the pattern of suicide cognitions across the four suicidality groups.
From the line graph above, it appears that the SCS pattern seems to hold even when there exists no depression, which suggests that suicidal thoughts may be influenced by other factors; that suicidal thoughts can take place without being in a depressed state; that cognition has some degree of independence from depression. Also, it is noted that as levels of depression increase, levels of cognition within groups increase significantly.

Question (Q) / Hypothesis (Ho):
If depression has no interaction effect (directly influence on patterns of suicidal cognitions), how do other variables hold up such as satisfaction with life, resilience?

Life Satisfaction

Descriptive Statistics
Dependent Variable: TotalSCS

Sat LIfe 2 Grps	Lifetime ideation or attempt	Mean	Std. Deviation	N
1 Not satisfied with life	Never	23.0000	6.21825	4
	Just a brief passing thought	34.8000	10.73313	5
	Had a plan at least once	49.2000	11.91158	15
	Have attempted to kill myself	57.1562	11.14164	32
	Total	50.5893	14.83948	56
2 Satisfied with life	Never	20.6333	5.30766	30
	Just a brief passing thought	24.6111	6.27918	18
	Had a plan at least once	33.7143	14.40734	7
	Have attempted to kill myself	36.3333	7.02377	3
	Total	24.2586	8.67657	58
Total	Never	20.9118	5.37315	34
	Just a brief passing thought	26.8261	8.35927	23
	Had a plan at least once	44.2727	14.43601	22
	Have attempted to kill myself	55.3714	12.29080	35
	Total	37.1930	17.88749	114

Levene's Test of Equality of Error Variances[a]
Dependent Variable: TotalSCS

F	df1	df2	Sig.
2.866	7	106	.019

Tests the null hypothesis that the error variance of the dependent variable is equal across groups.
a. Design: Intercept + SatLiveGroups2 + SBQ01 + SatLiveGroups2 * SBQ01

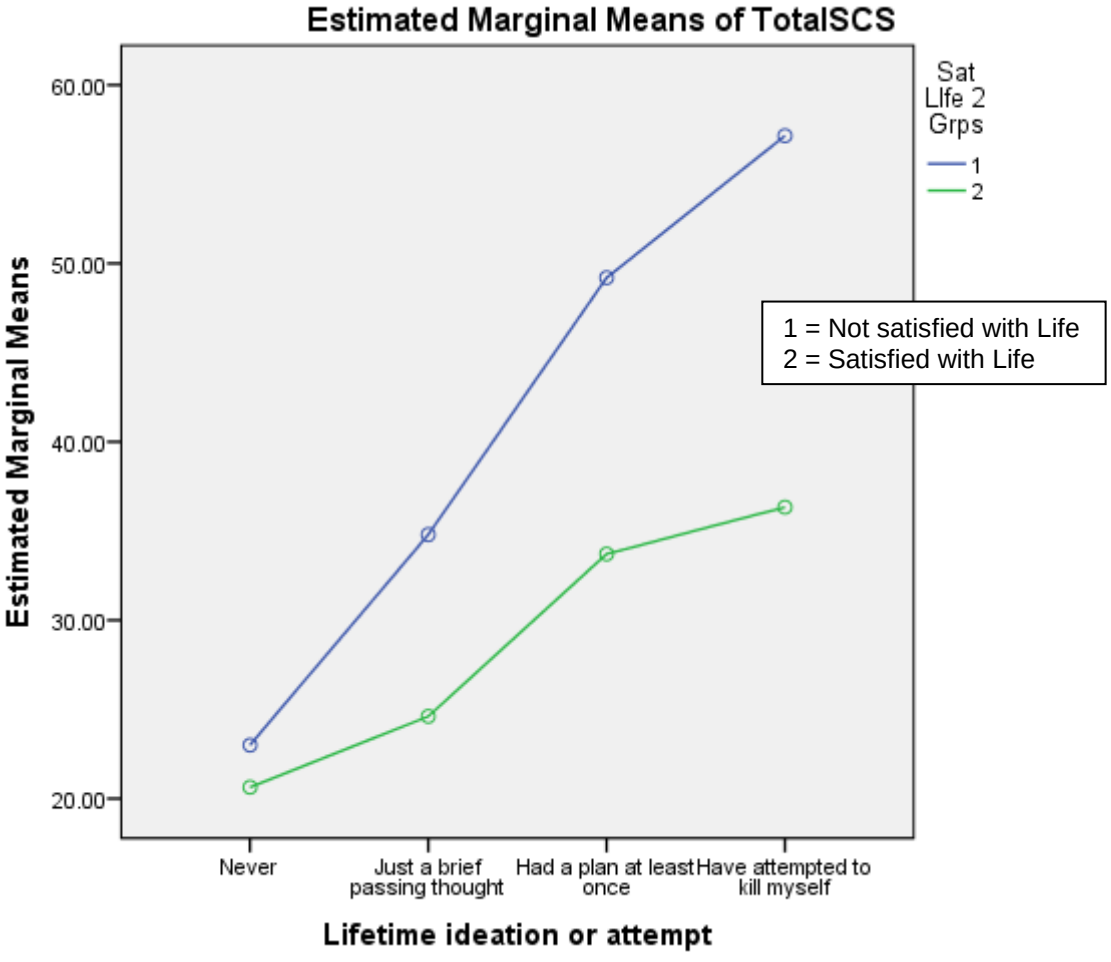
Before looking at the statistical significance of these differences, it is acknowledged that the data do satisfy the homogeneity assumption. The Levene's test is not significant at 0.01 and so a Ho of no difference in between group variances is retained.

Tests of Between-Subjects Effects

Dependent Variable: TotalSCS

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	26912.996[a]	7	3844.714	44.093	.000	.744
Intercept	70163.197	1	70163.197	804.662	.000	.884
SatLiveGroups2	2145.299	1	2145.299	24.603	.000	.188
SBQ01	5197.040	3	1732.347	19.867	.000	.360
SatLiveGroups2 * SBQ01	611.869	3	203.956	2.339	.028	.062
Error	9242.758	106	87.196			
Total	193854.000	114				
Corrected Total	36155.754	113				

a. R Squared = .744 (Adjusted R Squared = .727)



Conclusion:

This significant finding suggests that there is an interaction effect between suicidal cognitions and level of satisfaction with life. From the line graph above, it would appear that not being satisfied with life has a dramatic (and significant) impact on levels of suicidal cognitions. Being satisfied with life does not seem to change the pattern of suicidal cognitions across groups, however, as levels of

dissatisfaction increase there seems to be a rapid change in cognitive beliefs of hopelessness. A one-way ANOVA can be used to confirm this; it is expected that levels of satisfaction with life decline significantly across the four suicidality groups (see below).

Descriptives

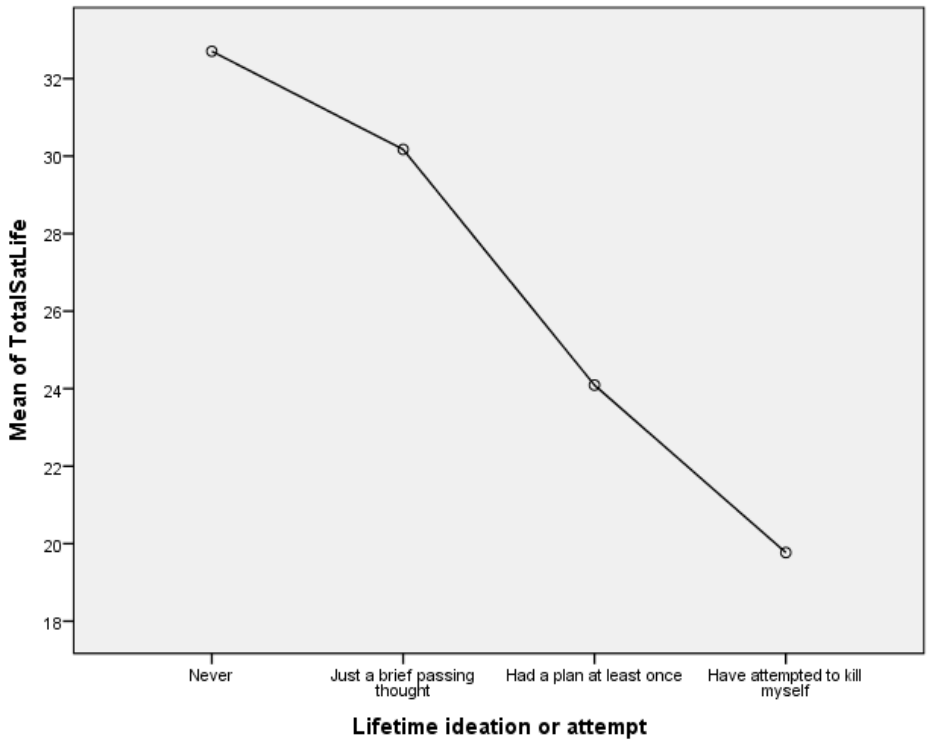
TotalSatLife

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
Never	34	32.71	3.681	.631	31.42	33.99	28	40
Just a brief passing thought	23	30.17	3.326	.693	28.74	31.61	23	38
Had a plan at least once	22	24.09	7.097	1.513	20.94	27.24	11	38
Have attempted to kill myself	35	19.77	5.719	.967	17.81	21.74	12	33
Total	114	26.56	7.403	.693	25.19	27.93	11	40

ANOVA

TotalSatLife

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	3331.717	3	1110.572	42.709	.000
Within Groups	2860.353	110	26.003		
Total	6192.070	113			



Resilience

Descriptive Statistics
Dependent Variable: TotalSCS

Resilience 2 groups	Lifetime ideation or attempt	Mean	Std. Deviation	N
1 Low Resilience	Never	22.2000	6.26099	5
	Just a brief passing thought	33.5000	12.50333	4
	Had a plan at least once	48.0556	12.73472	18
	Have attempted to kill myself	57.1562	10.86311	32
	Total	49.8136	15.36843	59
2 High Resilience	Never	20.6897	5.29894	29
	Just a brief passing thought	25.4211	6.88247	19
	Had a plan at least once	27.2500	8.22091	4
	Have attempted to kill myself	36.3333	12.01388	3
	Total	23.6545	7.42672	55
Total	Never	20.9118	5.37315	34
	Just a brief passing thought	26.8261	8.35927	23
	Had a plan at least once	44.2727	14.43601	22
	Have attempted to kill myself	55.3714	12.29080	35
	Total	37.1930	17.88749	114

Levene's Test of Equality of Error Variances[a]
Dependent Variable: TotalSCS

F	df1	df2	Sig.
2.744	7	106	.012

Tests the null hypothesis that the error variance of the dependent variable is equal across groups.
a. Design: Intercept + Resil2Grps + SBQ01 + Resil2Grps * SBQ01

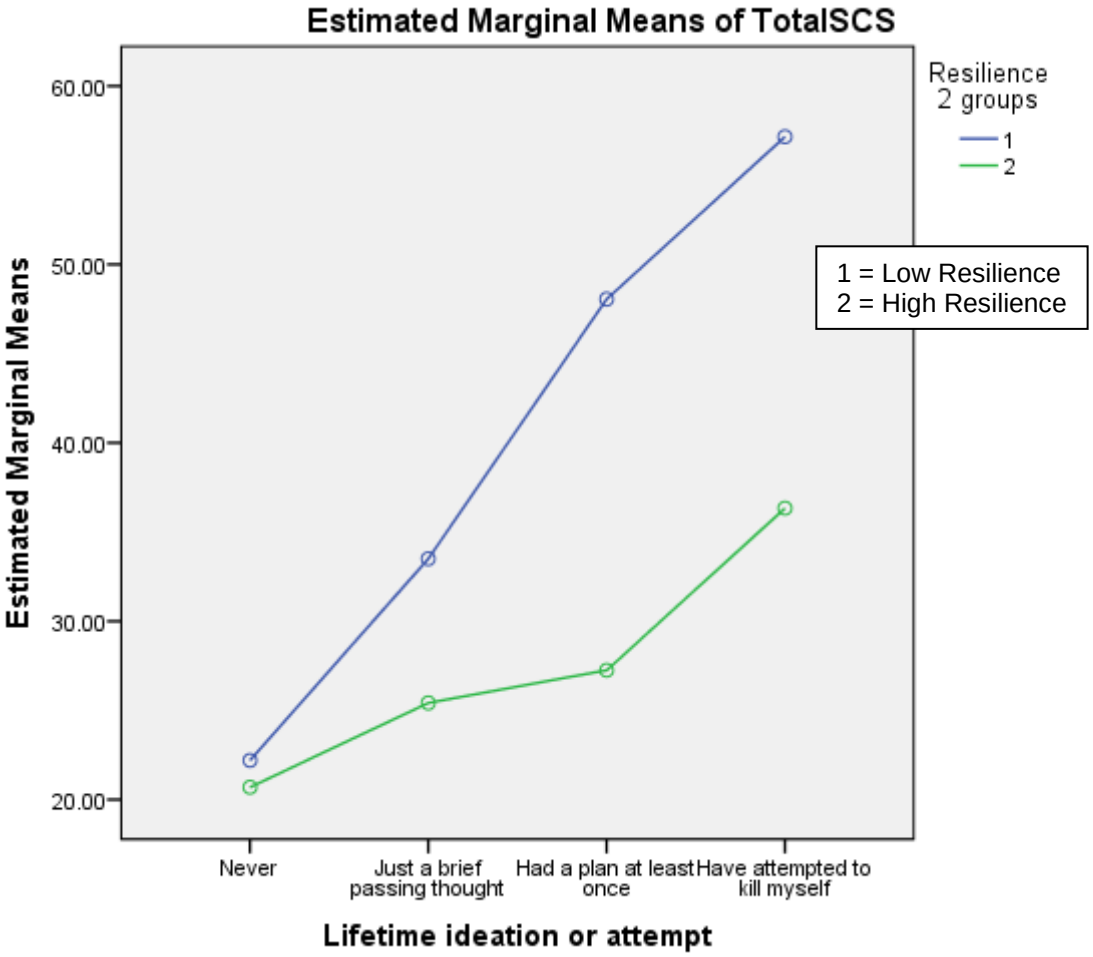
Before looking at the statistical significance of these differences, it is acknowledged that the data do satisfy the homogeneity assumption. The Levene's test is not significant at 0.01 and so a Ho of no difference in between group variances is retained.

Tests of Between-Subjects Effects

Dependent Variable: TotalSCS

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	26984.536[a]	7	3854.934	44.555	.000	.746
Intercept	60656.309	1	60656.309	701.059	.000	.869
Resil2Grps	2172.916	1	2172.916	25.114	.000	.192
SBQ01	4780.355	3	1593.452	18.417	.000	.343
Resil2Grps * SBQ01	985.728	3	328.576	3.798	.012	.097
Error	9171.218	106	86.521			
Total	193854.000	114				
Corrected Total	36155.754	113				

a. R Squared = .746 (Adjusted R Squared = .730)



Conclusion:

This significant finding suggests that there is an interaction effect between suicidal cognitions and level of resilience. From the line graph above it would appear that a lower level of resilience has a dramatic (and significant) impact on levels of suicidal cognitions. Being resilient does not seem to change the pattern of suicidal cognitions across groups, however, as levels of resilience decline there seems to be a rapid change in cognitive beliefs of hopelessness.

A one-way ANOVA can confirm this; it is expected that levels of resilience will decline significantly across the four suicidality groups (see below).

Descriptives

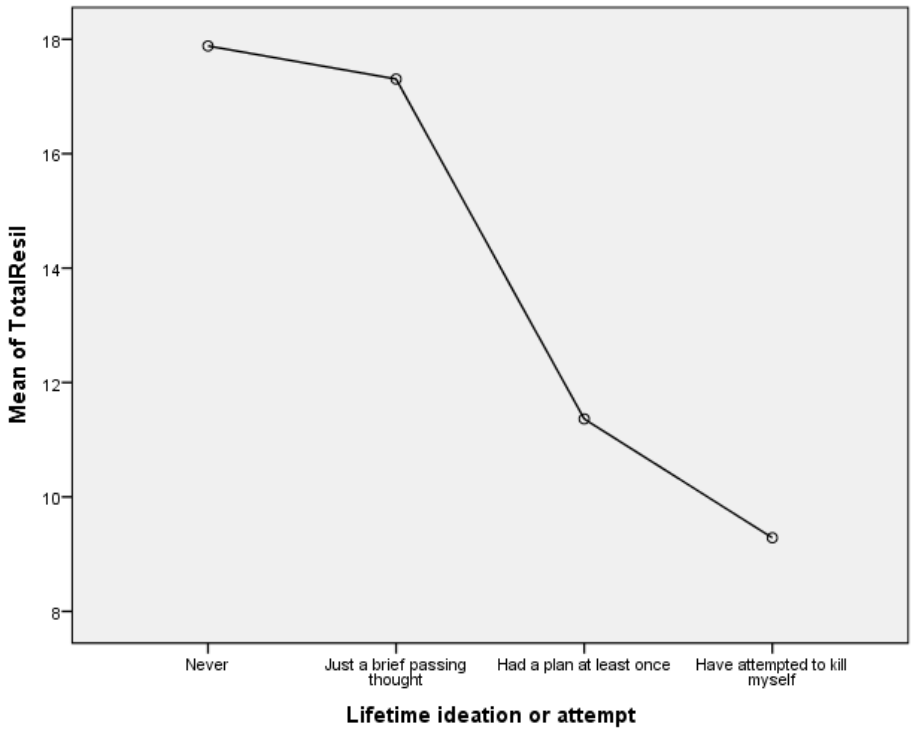
TotalResil

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
Never	34	17.88	2.783	.477	16.91	18.85	13	24
Just a brief passing thought	23	17.30	2.601	.542	16.18	18.43	12	23
Had a plan at least once	22	11.36	3.685	.786	9.73	13.00	6	18
Have attempted to kill myself	35	9.29	2.936	.496	8.28	10.29	6	16
Total	114	13.87	4.865	.456	12.97	14.77	6	24

ANOVA

TotalResil

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	1692.394	3	564.131	63.151	.000
Within Groups	982.633	110	8.933		
Total	2675.026	113			



Neurotic Personality Traits

The data show that people with more emotionally unstable (neurotic) personalities are more likely to plan or attempt suicide. The suggestion is, according to the logistic model (see below), that those with neurotic traits end up in these groups as they are more likely to think in terms of the hopelessness of their life and circumstances. There is no significant difference between Nevers and Thinkers or between Planners and Attempters. However, there is a large negative significant score between for non-clinical and clinical groups.

Descriptives

NeuroticStable

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
Never	34	2.0000	.00000	.00000	2.0000	2.0000	2.00	2.00
Just a brief passing thought	23	1.9130	.28810	.06007	1.7885	2.0376	1.00	2.00
Had a plan at least once	22	1.2727	.45584	.09719	1.0706	1.4748	1.00	2.00
Have attempted to kill myself	35	1.0571	.23550	.03981	.9762	1.1380	1.00	2.00
Total	114	1.5526	.49942	.04677	1.4600	1.6453	1.00	2.00

Multiple Comparisons

Dependent Variable: NeuroticStable

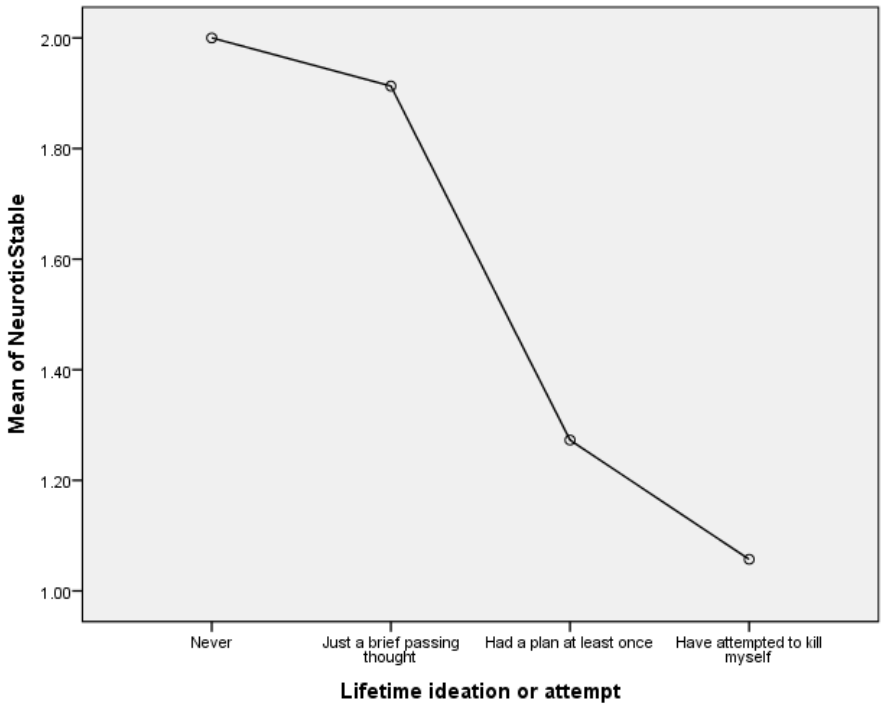
	(I) Lifetime ideation or attempt	(J) Lifetime ideation or attempt	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
Tukey HSD	Never	Just a brief passing thought	.08696	.07315	.635	-.1039	.2778
		Had a plan at least once	.72727*	.07414	.000	.5339	.9207
		Have attempted to kill myself	.94286*	.06524	.000	.7727	1.1131
	Just a brief passing thought	Never	-.08696	.07315	.635	-.2778	.1039
		Had a plan at least once	.64032*	.08080	.000	.4295	.8511
		Have attempted to kill myself	.85590*	.07273	.000	.6662	1.0456
	Had a plan at least once	Never	-.72727*	.07414	.000	-.9207	-.5339
		Just a brief passing thought	-.64032*	.08080	.000	-.8511	-.4295
		Have attempted to kill myself	.21558*	.07372	.021	.0233	.4079
	Have attempted to kill myself	Never	-.94286*	.06524	.000	-1.1131	-.7727
		Just a brief passing thought	-.85590*	.07273	.000	-1.0456	-.6662
		Had a plan at least once	-.21558*	.07372	.021	-.4079	-.0233
Dunnett T3	Never	Just a brief passing thought	.08696	.06007	.625	-.0856	.2595
		Had a plan at least once	.72727*	.09719	.000	.4470	1.0076
		Have attempted to kill myself	.94286*	.03981	.000	.8320	1.0537
	Just a brief passing thought	Never	-.08696	.06007	.625	-.2595	.0856
		Had a plan at least once	.64032*	.11425	.000	.3229	.9577
		Have attempted to kill myself	.85590*	.07207	.000	.6571	1.0547
	Had a plan at least once	Never	-.72727*	.09719	.000	-1.0076	-.4470
		Just a brief passing thought	-.64032*	.11425	.000	-.9577	-.3229
		Have attempted to kill myself	.21558	.10502	.251	-.0802	.5114
	Have attempted to kill myself	Never	-.94286*	.03981	.000	-1.0537	-.8320
		Just a brief passing thought	-.85590*	.07207	.000	-1.0547	-.6571
		Had a plan at least once	-.21558	.10502	.251	-.5114	.0802

*. The mean difference is significant at the 0.05 level.

ANOVA

NeuroticStable

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	20.109	3	6.703	91.304	.000
Within Groups	8.075	110	.073		
Total	28.184	113			



Question (Q) / Hypothesis (Ho):

While conducting a series of ANOVAs can help make sense of the way in which a range of variables interact with the DV (SCS), it does not provide evidence of how important suicidal cognitions are, relative to other variables, in predicting the risk of suicidality. The question to be addressed is: Is it possible to construct a predictive model of variables that would help identify those participants who are suicidal?

Type of Analysis: In order to address this, **Logistic Regression Analysis** must be used. Binary Logistic Regression requires dichotomous variables, and so key variables were recoded accordingly. This includes the IV (SBQ01 – suicidal groups) which will now have two values: 0= Never and Thinkers (non-suicidal) and 1=Planners and Attempters (suicidal). For the purposes of Logistic Regression, the IV (SBQ01) will now become the DV; to investigate whether suicidality/or not can be predicted based on a series of IVs (such as age, gender, personality, etc). Also, the DV (SCS) will now become an IV as a participant's suicidal cognitions will be used with other variables to predict suicidality (not suicidal or suicidal).

The predictor variable (IVs) used can be continuous (the only one predictor used is TotalSCS) or dichotomous. The list entered in an attempt to create a prediction model is below:

Categorical Variables Codings

		Frequency	Parameter coding (1)
Degree or higher	No degree	50	.000
	Degree or higher	64	1.000
Resilience 2 groups	Low	59	.000
	High	55	1.000
Sat LIfe 2 Grps	No	56	.000
	Yes	58	1.000
Extraversion	Introvert	53	.000
	Extravert	61	1.000
Relationship Status	Out	63	.000
	In	51	1.000
Gender	Male	56	.000
	Female	58	1.000
NeuroticStable	Neurotic	51	.000
	Stable	63	1.000

Note: As previously seen, depression is a powerful predictor of suicidality. However, due to the problem of multicollinearity, it has not been possible to meaningfully introduce it as a predictor variable in this analysis.

Results:

Case Processing Summary

Unweighted Cases[a]		N	Percent
Selected Cases	Included in Analysis	114	100.0
	Missing Cases	0	.0
	Total	114	100.0
Unselected Cases		0	.0
Total		114	100.0

a. If weight is in effect, see classification table for the total number of cases.

This shows that 114 cases were entered into the analysis.

Dependent Variable Encoding

Original Value	Internal Value
1	0
2	1

SPSS recoded the variables from 1 and 2 to 0 and 1. The DV (SBQ01 – suicidality) is now 0= not suicidal and 1= suicidal.

Categorical Variables Codings

		Frequency	Parameter coding (1)
Degree or higher	No degree	50	.000
	Degree or higher	64	1.000
Resilience 2 groups	Low	59	.000
	High	55	1.000
Sat LIfe 2 Grps	No	56	.000
	Yes	58	1.000
Extraversion	Introvert	53	.000
	Extravert	61	1.000
Relationship Status	Out	63	.000
	In	51	1.000
Gender	Male	56	.000
	Female	58	1.000
NeuroticStable	Neurotic	51	.000
	Stable	63	1.000

The frequency column confirms that there is a large enough sample population within each cell (> 50 in each).

Block 0: Beginning Block

Iteration History[a,b,c]

Iteration	-2 Log likelihood	Coefficients Constant
Step 0 1	158.038	.000

a. Constant is included in the model.
b. Initial -2 Log Likelihood: 158.038
c. Estimation terminated at iteration number 1 because parameter estimates changed by less than .001.

Classification Table[a,b]

			Predicted		
			Two Groups		
	Observed		1 not suicidal	2 Suicidal	Percentage Correct
Step 0	Two Groups	1 not suicidal	0	57	.0
		2 suicidal	0	57	100.0
	Overall Percentage				50.0

a. Constant is included in the model.
b. The cut value is .500

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 0	Constant	.000	.187	.000	1	1.000	1.000

Variables not in the Equation

			Score	df	Sig.
Step 0	Variables	NeuroticStable(1)	78.377	1	.000
		Resil2Grps(1)	59.055	1	.000
		SatLiveGroups2(1)	50.682	1	.000
		Extraversion(1)	18.653	1	.000
		RelateInOut(1)	4.293	1	.038
		AGE	.402	1	.526
		GENDER(1)	.000	1	1.000
		TotalSCS	69.396	1	.000
		EduDegree(1)	17.243	1	.000
	Overall Statistics		86.877	9	.000

The tables above under the heading Block 0 represent a regression analysis carried out without any of the prediction variables in the model. This acts as a baseline to compare against the model once the IVs have been included.

The classification table above claims to be able to predict 50% of cases without knowing anything about the IVs.

Block 1: Method = Enter

There is where the set of predictors (prediction model) is tested.

Iteration History[a,b,c,d]

Iteration		-2 Log likelihood	Coefficients									
			Constant	NeuroticStable(1)	Resil2Grps(1)	SatLiveGroups2(1)	Extraversion(1)	RelateInOut(1)	AGE	GENDER(1)	TotalSCS	EduDegree(1)
Step 1	1	60.225	.912	-1.959	-.942	-.325	.239	-.077	-.004	-.058	.020	.217
	2	46.680	1.095	-2.519	-1.425	-.529	.365	-.144	-.011	-.162	.042	.525
	3	42.525	1.275	-2.937	-1.613	-.534	.274	-.121	-.024	-.365	.066	.879
	4	41.511	1.409	-3.296	-1.709	-.432	.111	-.018	-.032	-.572	.086	1.079
	5	41.420	1.477	-3.473	-1.775	-.391	.047	.048	-.034	-.659	.093	1.115
	6	41.419	1.489	-3.497	-1.785	-.388	.040	.058	-.034	-.670	.094	1.116
	7	41.419	1.489	-3.497	-1.785	-.388	.040	.058	-.034	-.670	.094	1.116

a. Method: Enter

b. Constant is included in the model.

c. Initial -2 Log Likelihood: 158.038

d. Estimation terminated at iteration number 7 because parameter estimates changed by less than .001.

Omnibus Tests of Model Coefficients

		Chi-square	df	Sig.
Step 1	Step	116.618	9	.000
	Block	116.618	9	.000
	Model	116.618	9	.000

The Omnibus test demonstrates how well the new predicted model performs relative to the baseline Block 0 model, which is relative to guesswork. The highly significant result means that this study's model is significantly better at predicting suicidal cases that SPSS's baseline model.

Hosmer and Lemeshow Test

Step	Chi-square	df	Sig.
1	7.314	8	.503

The table above is another Goodness of Fit test for the model. This value should be non-significant; which it is (p = 0.503). Therefore, this confirms that the model is the best fit possible for the data.

Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	41.419[a]	.640	.854

a. Estimation terminated at iteration number 7 because parameter estimates changed by less than .001.

The above Model Summary produced more support for the predictive model. It gives some indication of how much variance in the DV (suicidality) is explained by the model. Here the two values 0.640 and 0.854 suggest that between 64% and 85.4% of variance is explained by the prediction variables.

Contingency Table for Hosmer and Lemeshow Test

		Two Groups = 1		Two Groups = 2		
		Observed	Expected	Observed	Expected	Total
Step 1	1	11	10.830	0	.170	11
	2	10	10.745	1	.255	11
	3	11	10.625	0	.375	11
	4	11	10.262	0	.738	11
	5	10	9.164	1	1.836	11
	6	3	4.813	8	6.187	11
	7	0	.441	11	10.559	11
	8	1	.084	10	10.916	11
	9	0	.027	11	10.973	11
	10	0	.009	15	14.991	15

Classification Table[a]

			Predicted		
			Two Groups		
	Observed		1 Not suicidal	2 suicidal	Percentage Correct
Step 1	Two Groups	1 not suicidal	55	2	96.5
		2 suicidal	4	53	93.0
	Overall Percentage				94.7

a. The cut value is .500

The above classification table gives some idea of how well the model is able to predict the correct category (non-suicidal or suicidal). The model correctly predicts 94.7% of cases overall, which is a great improvement on Block 0 guesswork of 50%. It terms of the sensitivity of the model, it was able to predict 93% of participants who were suicidal. The specificity of the model relates to its ability to predict those in the group without the key characteristic of interest. Here the model predicted 96.3% of cases in the not suicidal group.

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)	95% C.I.for EXP(B)	
								Lower	Upper
Step 1[a]	TotalSCS	.096	.048	3.945	1	.047	1.101	1.001	1.211
	Extraversion(1)	.245	1.017	.058	1	.810	1.277	.174	9.381
	NeuroticStable(1)	-3.724	1.065	12.218	1	.000	.024	.003	.195
	SatLiveGroups2(1)	-.787	1.085	.525	1	.469	.455	.054	3.822
	Resil2Grps(1)	-2.149	.902	5.677	1	.017	.117	.020	.683
	AGE	-.029	.038	.591	1	.442	.971	.901	1.047
	GENDER(1)	-.374	.884	.179	1	.672	.688	.122	3.889
	EduDegree(1)	1.382	1.034	1.785	1	.181	3.982	.525	30.230
	RelateInOut(1)	-.023	1.026	.001	1	.982	.977	.131	7.296
	Constant	3.699	1.991	3.450	1	.063	40.396		

a. Variable(s) entered on step 1: NeuroticStable, Resil2Grps, SCSGroups2, SatLiveGroups2, Extraversion, AGE, GENDER, EduDegree, RelateInOut.

The Variables in the Equation table provides information about the actual prediction model. The importance of each variable to the model is determined by its significance level. Here it is noted that three variables contribute significantly to the predictive ability of the model.

Conclusion:

The model suggests that the major factors influencing whether an individual is suicidal are: suicidal cognitions reflecting a pervasive sense of hopelessness (unbearable, unsolvable and unlovable), a neurotic personality type and a low level of resilience. The remaining variables (in relative terms) are not that important within the model. So the range of factors that do not seem to directly influence suicidality are: age, gender, education, relationship status, social satisfaction and being extraverted.

The negative B scores (in the B column) for Neurotic/Stable and Resil2Grps suggest that less of these values will increase probability of inclusion in the suicidal category of the DV.

Exp(B) column shows the odds ratio (OR) for each IV. This is the increase (or decrease if less than 1) of being in an outcome category (not suicidal or suicidal) when the value of the IV increases by 1 unit. Thus, the odds of a person stating that they are suicidal is 1.101 times higher for someone who reports a 1-unit increase in suicidal cognitions. The other two are inverse and suggest that for every unit increase (more resilient or emotionally stable) there are fractionally lower odds of someone reporting being suicidal.

The actual odds ratio (OR) is within the 95% confidence interval.